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HIGH REYNOLDS NUMBER FLOWS
AROUND SMOOTH AND ROUGH CYLINDERS

VOLUME I

MEAN SURFACE PRESSURE DISTRIBUTION

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HIGH REYNOLDS NUMBER FLOWS
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VOLUME I

MEAN SURFACE PRESSURE DISTRIBUTION

02 March 1987

by

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19 ABSTRACT (Continue on reverse if necessary and identify by block number)

Nonsteady phenomena associated with flows around smooth and rough cylinders at high Reynolds numbers $(0.3 - 8 \times 10^6)$ were investigated. Boundary-layer profiles were surveyed. Mean and fluctuating surface pressures were measured in both the circumferential and the spanwise directions.

The mean surface pressure data are compiled and presented in the Volume 1 report using both graphical and tabular format. Mean sectional drag and lift coefficients were calculated. The drag coefficients, the base pressures, and the boundary-layer separation angles were also compared to data existing in the literature.

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PREFACE

A workshop was held in November, 1979 at NASA Ames Research Center (Shih 1981) to discuss the current status of knowledge of flow past circular cylinders at high Reynolds numbers and to obtain a general consensus on a definitive set of experiments to clarify some of the remaining uncertainties. These recommendations became the basis for a series of cylinder-flow investigations performed at high Reynolds number in the NASA Ames 12-foot pressurized wind tunnel in 1982. The experimental program was designed to provide test data on circular cylinders at Reynolds numbers in the range of 10^5 to 8×10^6. Steady and unsteady pressure data around and along smooth and rough cylinders were obtained. A number of boundary-layer surveys were also carried out.

The main purpose of the present research is to investigate unsteady phenomena associated with flow at high Reynolds numbers around smooth and rough cylinders, using data collected during the 1982 experiments. To provide a foundation, the steady static-pressure data are described in the present report. Pressure-distribution data are compiled and presented in both graphical and tabular format. Boundary-layer data and unsteady-flow data will be described in later reports.

This research is sponsored by the Office of Naval Research under contract number N00014-85-C-0764. Dr. E.A. Silva is the technical monitor of both the present research and the wind tunnel experiments conducted in 1982. Dr. W.C.L. Shih of PRi is the principal investigator and Prof. D. Coles of California Institute of Technology has served as consultant for the project.

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1.0 INTRODUCTION

The large variety of fluid phenomena existing in the flow around circular cylinders has provided a challenging research area for the study of fundamental fluid-mechanical behavior. The flow features of interest include (1) boundary-layer flow in a strongly varying pressure gradient; (2) boundary-layer separation; (3) vortex shedding and unsteady flows; (4) wake transition; (5) boundary-layer transition; and (6) effects of surface roughness. Although of obvious intrinsic interest, cylinder or cylinder-like flows are also of practical concern relative to cable strumming phenomena on hydrophone cables or towed acoustic arrays, flows about sonar domes and cylindrical structures, and boundary-layer behavior on hulls and hydrofoils.

Large-scale applications and/or high speeds in water can result in cylinder Reynolds numbers exceeding 10^7 to 10^8, a range where almost no data exist. Although a considerable amount of work has been devoted to cylinder-flow phenomena, there is still much to be learned concerning flow behavior at high Reynolds numbers, particularly with regard to effects of surface roughness on turbulent boundary-layer separation, coherence of separation along the length of the cylinder, and vortex shedding.

Only a few investigators (e.g., Miller 1976, Szechenyi 1975, Achenbach 1971, Guven et. al. 1975) have carried out systematic measurements of the effects of uniform surface roughness on mean cylinder loads, and only Szechenyi has made detailed measurements of the effects of surface roughness on unsteady loads. Completely missing from the literature is information about extreme unsteady loads, which can substantially exceed the rms values.

There is evidence that at sufficiently high Reynolds numbers the drag coefficient of a cylinder no longer depends on Reynolds number, but

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depends only on relative roughness height, as in the case of flow in a rough pipe. An investigation of Reynolds-number independence is an important objective of the current tests.

Roughness affects the position of boundary layer separation, and hence the steady and unsteady force coefficients, by influencing the boundary layer in two ways. Roughness on a surface ahead of transition tends to move the transition forward; roughness beneath the turbulent boundary layer changes the velocity profile. A better understanding of the effects of surface roughness on the boundary layer in the presence of large pressure gradients can provide a means for extrapolation of existing data to higher Reynolds numbers. Systematic measurements of the effects of surface roughness on boundary layer transition and separation on smooth and rough cylinders are required to characterize flow at high Reynolds numbers. The roughness parameter, k/D, will modify the flow regimes, generally by increasing the minimum drag coefficient and shifting the critical Reynolds number (cf. Figure 1.1) to the left. This behavior has been previously well documented (e.g., Fage and Warsap 1929, Achenbach 1971).

Values of mean-drag coefficients of smooth cylinders at high Reynolds numbers have been the subject of numerous investigations but remain uncertain (Figure 1.2). Experimental data are not available in the cylinder Reynolds number range from 10^7 to 10^8, and there is considerable disagreement in the Reynolds number range from 10^5 to 10^7. Much of this disagreement has been attributed to surface roughness, and it appears that extreme care must be taken in preparing the model surface. At Reynolds numbers greater than some roughness-dependent value (Figure 1.3), the data of several investigators (Roshko 1961, Jones et. al. 1969, Achenbach 1971, Szechenyi 1975) suggest that the drag coefficient is independent of cylinder Reynolds number and is a function of surface

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roughness only (Figure 1.2).

The objectives of the test program in the Ames 12-foot pressurized tunnel were (1) to determine steady and unsteady flow properties on smooth and rough cylinders over the maximum achievable Reynolds numbers (up to 8×10^6); and (2) to investigate the Reynolds number independence regime of drag coefficient for rough cylinders. These objectives were achieved by using a 1-foot cylinder instrumented with steady and unsteady surface-pressure gauges distributed circumferentially and longitudinally on the cylinder.

2.0 MODEL AND INSTRUMENTATION

2.1 MODEL DESIGN

A twelve-inch (nominal) diameter smooth cylinder model was made available through the cooperation of Dr. Gerald Malcolm of NASA and Prof. William James of Iowa State University (ISU). The NASA/ISU model consisted of an instrumented 8.5-foot long 12.46-inch diameter center-section mounted on two supports of slightly reduced diameter to produce an 11.3-foot long cylinder spanning the tunnel, (L/D=11) as shown in Figure 2.1. The model wall thickness was approximately 0.4 inches. The steel cylinder was polished to an 8-micron surface finish and was chromium-plated to preserve the surface. Model rotation was available up to 38 degrees. Instrumentation was installed through an access door in the rear of the model.

End plates were designed following the recommendations of Morkovin (Shih 1981) to minimize tunnel-wall boundary-layer effects on flow past the cylinder (Figure 2.2). The end plates were stationary 36-inch diameter, 3/4-inch thick aluminum plates attached to the tunnel wall by three pylons. The end plates were approximately 17 inches from the tunnel wall. The cylinder passed through the upstream portion of the end plates so that about two cylinder diameters of each plate trailed behind the cylinder.

2.2 ROUGHNESS SIMULATION

The dimensionless parameters governing the flow past a cylinder are the Reynolds number based on cylinder diameter, Re_D, the relative surface roughness, k/D, and the free-stream Mach number, M_∞. To minimize compressibility effects, the free-stream Mach number during the present tests were required to be less than 0.3. Roughness geometry was specified by use of square-mesh wire screens (Figure 2.3) according to the following

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table:

TABLE 2.1 SIMULATED ROUGHNESS

WIRE DIAM. (in.)	MESH	% OPEN	k/D
0.0016	250	36	3.0×10^{-4}
0.0075	60	30.5	1.20×10^{-3}
0.063	6	38.9	1.01×10^{-2}

Screens were chosen over alternative types of surface roughness for a number of reasons. Screens can be attached to and removed from the model in a short time. The roughness can be precisely duplicated in future tests if desired. No debris will be inadvertently introduced into the airstream from sandpaper grit or glued-on roughness elements, avoiding a major concern of the tunnel personnel. Previous experience has demonstrated that screens do not interfere with the measurement of surface pressure (Hove et.al. 1978).

Three different screen sizes ($k/D = 3 \times 10^{-4}$, 1.2×10^{-3}, 1×10^{-2}) were used during the experiments. The screens were fabricated in two end sections and one center section. Each section was wrapped around the model and secured with 30-mil safety wire on the leeward side of the model, as illustrated in Figure 2.4.

2.3 MODEL AND TUNNEL INSTRUMENTATION

The Twelve-foot Pressure Tunnel at NASA Ames Research Center (Figure 2.5) was employed for the circular cylinder tests for a number of reasons. The test section is large enough (roughly 11.3 feet square) to accommodate a model that can be easily instrumented. The tunnel is a variable-density, low-turbulence facility with flow well controlled in the

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Mach number range from 0 to 1.0. Operation at a supply pressure of 5 atmospheres provides a maximum free-stream Reynolds number of 9.4×10^6 per foot at $M_\infty = 0.29$ (Figure 2.6). Thus, a model having a diameter of 1.1 foot could be tested at a Reynolds number of approximately 10^7; in practice, a Reynolds number of 8×10^6 was achieved. Free-stream dynamic pressures can range from less than 10 to 600 lbs/ft^2. Because the cylinder model had previously been used for smooth-cylinder tests, (James et.al. 1979) no structural modification was required except for the installation of end plates.

Reynolds-number variation in the 12-foot tunnel during the present experiments was generally achieved by changing the tunnel pressure at fixed velocity. However, a few runs were made in which the free-stream velocity was changed at fixed tunnel pressure. Boundary-layer and/or shear-layer transition and roughness effects may have been different in these two modes. Variation of Reynolds number during the experiments covered the range of about 3×10^5 to 8×10^6.

The model was instrumented to determine section steady and unsteady pressure distributions at midspan, and spanwise steady and unsteady pressure distributions along several generators (Figure 2.7.a,b) to check the two-dimensionality of the flow. Static-pressure taps were located every 20 degrees around the model at midspan (18 taps) and along 3 generators at 4, 64, and 124 degrees from the front stagnation line (24 taps). The first spanwise tap was 6 inches from the model centerline and the taps were spaced 6 inches apart along the left side of the model (looking upstream). Each of the 42 steady pressure orifices has been associated with an ID number. These ID numbers are listed in Table 2.2 for future reference. A ring of 12 equally spaced unsteady pressure gauges (stainless steel Kulite transducers) was located 3 inches to the right of

centerline, and unsteady gauges were also located 6 inches apart along generators at 34 and 94 degrees from the leading edge (16 gauges).

Static pressure measurements on the model were made using scanivalves each containing 23 ports. (The scanivalves consisted of six wafers and ten active ports per wafer; 42 pressures of 60 possible were recorded). The pressure transducer was a 15-psi Statham used in a differential mode. The scanivalves were connected to the surface pressure ports via long lead lines internal to the model, and the transducer signals were routed to a recording device via instrument cable through the model end plate. The time delay during the scanivalve scan was 0.6 seconds.

Unsteady pressure measurements were made with Kulite model XCQL-7A-093-4D and XCQL-17-093-4D pressure transducers (Figure 2.8) provided by NASA. The model 17 transducer was equipped with a protective screen. These 0.093-inch diameter gauges employ an integrated circuit bridge on a silicon diaphragm, and consequently can measure mean as well as fluctuating pressures. To avoid DC drift, however, the transducers were AC-coupled, so that only AC fluctuations were recorded. The signals were also low-pass filtered before recording by an AMPEX tape recorder. The cutoff frequency was 50 kHz. The transducers were rated for +4 psid, and had a vendor-quoted accuracy of 5 percent. Because of the small operational range of the transducer, each Kulite reference pressure was supplied by a selected static pressure at essentially the same angular location on the model. Each reference static pressure was teed just before the scanivalve and connected to the Kulite reference line. The static taps responsible for the Kulite reference pressure were listed in Table 2.3 for future reference.

Boundary-layer profiles were measured using a removable rake (Figure 2.9.a,b). The boundary-layer probe consisted of five miniature Pitot tubes

situated horizontally next to each other by 0.20 inches. The Pitot tubes were flattened at the end so that they were 0.06 inches wide and only 0.02 inches thick.

TABLE 2.2 PRESSURE ORIFICE ID CODES FOR DIFFERENT ANGULAR & AXIAL LOCATIONS

PRESSURE ORIFICE ID CODE

THETA	ID	THETA	ID	THETA	ID
0	P102	120	P411	240	P606
5	"	125	"	245	"
10	"	130	"	250	"
15	"	135	"	255	"
20	"	140	"	260	"
20	P111	140	P502	260	P607
25	"	145	"	265	"
30	"	150	"	270	"
35	"	155	"	275	"
40	"	160	"	280	"
40	P202	160	P602	280	P608
45	"	165	"	285	"
50	"	170	"	290	"
55	"	175	"	295	"
60	"	180	"	300	"
60	P302	180	P603	300	P609
65	"	185	"	305	"
70	"	190	"	310	"
75	"	195	"	315	"
80	"	200	"	320	"
80	P311	200	P604	320	P610
85	"	205	"	325	"
90	"	210	"	330	"
95	"	215	"	335	"
100	"	220	"	340	"
100	P402	220	P605	340	P211
105	"	225	"	345	"
110	"	230	"	350	"
115	"	235	"	355	"
120	"	240	"	360	"

ID FOR PRESSURE ORIFICES AT DIFFERENT X/D

THETA	X/D=0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4	P103	P104	P105	P106	P107	P108	P109	P110
9	"	"	"	"	"	"	"	"
14	"	"	"	"	"	"	"	"
19	"	"	"	"	"	"	"	"
24	"	"	"	"	"	"	"	"
64	P303	P304	P305	P306	P307	P308	P309	P310
69	"	"	"	"	"	"	"	"
74	"	"	"	"	"	"	"	"
79	"	"	"	"	"	"	"	"
84	"	"	"	"	"	"	"	"
124	P503	P504	P505	P506	P507	P508	P509	P510
129	"	"	"	"	"	"	"	"
134	"	"	"	"	"	"	"	"
139	"	"	"	"	"	"	"	"
144	"	"	"	"	"	"	"	"

TABLE 2.3 REFERENCE PRESSURE TAPS FOR KULITE TRANSDUCERS

KULITE NO.	REFERENCE STATUC PRESSURE
D1	P_{102}
D2	P_{111}
D3	P_{302}
D4	P_{311}
D5	P_{411}
D6	P_{502}
D7	P_{603}
D8	P_{604}
D9	P_{606}
D10	P_{607}
D11	P_{609}
D12	P_{610}
D13	P_{202}
D14	"
D15	"
D16	"
D17	"
D18	"
D19	"
D20	"
D21	P_{402}
D22	"
D23	"
D24	"
D25	"
D26	"
D27	"
D28	"

2.4 TEST PROCEDURES

The basic measurements made were the mean and time-varying surface pressures, boundary-layer profiles from pitot traverses, and flow visualization over the uninstrumented span of the smooth cylinder.

Because even the stain left behind from finger prints has been known to affect the flow in the critical Reynolds-number regime, the model was carefully cleaned prior to the various smooth-cylinder runs. Since boundary-layer transition is very sensitive to surface finish, it was important that the chrome-plated cylinder not be marred in any way. To maintain surface smoothness, the rough-cylinder runs using screens were performed after all the smooth-cylinder runs had been completed.

Four different model configurations were tested each at more than a dozen Reynolds numbers spanning the range from 3×10^5 to 8×10^6. Each configuration was given a code number for identification (Table 2.4). During each run at a given Reynolds number, five sequences of measuresment were conducted, each at a different rotation angle for the cylinder model. The first sequence corresponds to zero angle of rotation. Each of the following sequences was rotated five degrees away from the previous sequence. Hence, pressure-tap positions coincide for the first and last sequence of each run. After steady and unsteady surface pressures were recorded for all Reynolds numbers and model rotations of a given configuration, the boundary-layer probe was installed, and a number of boundary-layer traverses were performed.

TABLE 2.4   HIGH REYNOLDS NUMBER FLOW TEST MATRIX

Conf. Code	Configuration
1	Smooth
2	Rough $k/D = 3.0 \times 10^{-4}$
3	Rough $k/D = 1.20 \times 10^{-3}$
4	Rough $k/D = 1.01 \times 10^{-2}$

2.5 DATA ACQUISITION

Surface-pressure data from the instrumented model were recorded in two different formats. The steady pressure data from the scanivalve output were input directly into a Beckman 210 System and stored on punched paper tape. The punched paper tape was then read into the NASA 360/67 automatic data-reduction equipment. The dynamic transducer outputs were stored in analog form by an Ampex FR1800 32-track FM tape recorder. The overall arrangement for data acquisition is shown in Figure 2.10.

The following parameters were printed out on the on-line system to check data credibility:

o Run conditions corrected (using Vincent's technique) and uncorrected for blockage - if applicable, Run No., Model Roll Angle, Configuration Code, q_∞ , T_∞ , P_∞ , P_T, Re_D, M_∞ , U_∞

o All pressure coefficients (corrected and uncorrected for blockage)

o Integrated lift and drag coefficients (corrected and uncorrected for blockage)

These data were continuously compared with pre-test predictions and with

previous measurements to determine if any gross inconsistencies existed in the data.

All data listed above, with the exception of the integrated lift and drag and RMS values, were recorded on digital magnetic tape (Label 90352F) in standard NASA Ames transmittal tape format, as shown in Fig. 2.11. In addition to the magnetic tape, a formatted listing of all data was also obtained.

3.0 STATIC DATA

3.1 DATA RETRIEVAL

The original static-pressure data measured at the circumferential and axial pressure ports were recorded on a 9-track magnetic tape (Label 90352F) by an IBM 360/67 digital computer using EBCDIC code. This data tape was used to generate the plots and tables of pressure coefficients of this report. Only the uncorrected (for blockage) values are presented since the methods used for correction are somewhat subjective.

To retrieve the stored data, the EBCDIC coded data tape was first read and converted into ASCII format by a Digital Equipment Corporation VAX 11/750 computer which was also used for the rest of the data processing. The converted data file was printed out and its accuracy confirmed by comparison with an original printout provided by NASA Ames and a second printout generated independently by D. Coles. In all three printouts of the data files, there were a few instances where non-numeric characters appearing in a numeric field, due possibly to errors occurring during digital sampling or recording. These isolated bad data were discarded on an ad hoc basis.

In both the converted ASCII data file and the printouts, pressure data that were not available (due to either absent or disabled pressure ports, at locations P_{109} for all of the runs; and P_{104}, P_{402}, P_{503}, P_{504}, P_{509} and P_{510} for some of the runs) were recorded as blank spaces. These blank spaces do not represent zeroes of pressure coefficients. It was therefore necessary to make a distinction between zeroes and blanks in order to read the data correctly by FORTRAN REAL format commands. This was accomplished by first editing the file and substituting all the character strings 0.0000 by 0.0001. No changes were made to any other character strings. For the

entire data file, only a handful of such changes were actually made.

The data file was then read for a second time by using FORTRAN REAL format commands. Unless a pressure coefficient of 0.0 was encountered, the data were re-written in compact form directly into a new file using REAL format during the second pass. In case a pressure coefficient of 0.0 was found, corresponding to a string of blank spaces in the original data file, the pressure coefficient was replaced by 999.0000 and then recorded into the new file. Since the maximum Mach number involved during the Ames wind tunnel experiments was no more than 0.3, the maximum possible pressure coefficient is slightly greater than unity. The artificially inserted pressure coefficient of 999.0000 was therefore unambiguously used as a flag to identify unavailable data, and these were isolated from the rest of the data processing. In the case of the pressure coefficients modified from 0.0000 to 0.0001 during the first pass of the operation, as just discussed, no attempt was made to recover the original zeroes. The relevant error is, however, in the fourth digit and therefore negligible.

The new data files created by the approach discussed above were then compacted and were stored on a magnetic disc for easy access. All the rest of the data processing used this new file.

3.2 SAMPLING OF SURFACE PRESSURE DATA

There were altogether 166 sets of raw data available in the original data tape covering experiments using all four different roughness configurations (including the smooth cylinder). Each set of data corresponds to a Run composed of five sequences at different angular rotations of the cylinder model.

The pressure distributions around the cylinder surface were first assembled by sorting the data from each of the five sequences of each run

into the correct order. A complete set of pressure distribution plots based on all the available data was generated for all 166 runs by using the VAX 11/750 computer and a Sweet-P Model 600 plotter. These plots were compared to a set of hand-plotted pressure distributions provided by Coles. The two sets of plots match each other perfectly and the correctness of the computer programs used for data processing was therefore verified.

Assembly of an acceptable set of pressure-distribution data covering the Reynolds number range of interest for each of the four roughness configurations was a straight-forward mechanical operation, except for final inspection. Due either to instrumentation problems or flow unsteadiness or both, some of the available pressure-distributions were far from smooth. Some judgment was therefore needed to determine whether these data are authentic reproductions of the physical phenomena. Only those data of confidence were included in this report.

In the original plots provided by D. Coles, useful comments were available regarding the quality of the data. For example, the pressure distribution plots were graded as good, ragged, or very ragged. Pressure orifices which somehow were not functioning satisfactorily during the wind tunnel experiments were identified. Flows experiencing two different modes were also pointed out explicitly. These comments were weighted heavily in treating the available data during the rest of the analysis. The original log books maintained by W. Shih of PRi during the wind-tunnel experiments were another major source of valuable information.

The pressure distribution data were sampled as follows. First of all, pressure-distribution plots for a given configuration were assembled in order of increasing Reynolds number. The plots were examined carefully

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against Prof. Coles's comments and W. Shih's log books. If the data from a certain pressure orifice looked suspicious, and either one of the two references mentioned above indicated likewise, the data were deleted. This operation was performed on all the data files in one session. Upon completion, any data from a run involving a pressure orifice which gave bad data in adjacent runs were also deleted for consistency.

If the data looked suspicious, but none of the above-mentioned references suggested a reason, the data were checked against data collected from the same pressure orifice during runs adjacent in time and runs adjacent in Reynolds number. If the suspect data behave badly in runs adjacent in time but not in runs adjacent in Reynolds number, indicating a hardware problem at that time, the data collected during that time period were deleted. An example of data deleted on the ground of such a hardware problem is shown in Fig. 3.1.

Certain peculiar data that can not be attributed to hardware problems were actually found to be flow-related. An example is shown in Fig. 3.2, where the transitional flow ($Re_D = 0.37 \times 10^6$) around the smooth circular cylinder exhibits two different modes. Since the data points were collected from 18 pressure orifices during five different intervals of time corresponding to the five sequences, the two pressure-distribution curves in Fig. 3.2 emerge when the data from sequences 1 and 2 are assembled independently of the data from sequences 3, 4, and 5. It is worth noting that these five sequences of measurements were taken approximately one minute apart; and that the pressure-distribution curves of the two modes are symmetric about the plane which contains the 0° and 180° generators.

The circular cylinder wind tunnel experiment was designed in such a way that every known detail of the experiment was symmetric. A few

runs were found, surprisingly, to give surface pressure distributions that were consistenly non-symmetric but steady. An example is shown in Fig. 3.3. The circular cylinder in this flow experienced a lift coefficient of around 1.6, compared to its drag coefficient of around 0.5. The Reynolds number of this flow was 0.3×10^6. Explanations for this unexpected behavior are still open, but are thought to be related to asymmetric transition effects in the free shear layers following boundary-layer separation in the so-called critical Reynolds number regime.

3.3 PRESSURE-DISTRIBUTION PLOTS AND TABLES

All the data deleted for reasons described above were recorded in a log file which contains information on the run number, the sequence number, and the serial number or ID of the pressure orifice for which data were deleted. The final sets of pressure-distribution plots and tables were generated after either including or excluding certain data sets based solely on the information in this log file.

The compiled pressure-distribution plots and corresponding tables are included in Appendices I to V of this report. The pressure-distribution plots are arranged in order of increasing Reynolds number for each of the four different roughness configurations in Appendices I to IV. The tables of pressure coefficients are arranged in order of increasing run numbers in Appendix V. The coordinate system used for these data is defined in Figure 2.4.

The log file pertaining to all the data files presented in these plots and tables is given in Appendix VI. The main purpose of this log file is to document the editing operations that have been performed onto the data. The first and the second columns in the log file specify the run number and the roughness configuration, respectively. For each wind tunnel

run, the bad sequences and the bad orifices where data were deleted due to considerations described in Section 3.2 above were recorded as "BAD SEQS" and "BAD PORTS". Pressure orifices (P_{109} for all of the runs; and P_{104}, P_{402}, P_{503}, P_{504}, P_{509} and P_{510} for some of the runs, as discussed in Section 3.1 above) which were disabled during the experiments and hence provided no data, however, were not enlisted. The column "COMMENT" contains a qualitative rating of the pressure-distribution curves of each run; G and R, for example, stand for 'good' and 'ragged', respectively. Runs for which nonsteady pressure data (recorded by the AMPEX tape recorder) were digitized for future processing are indicated by 'DIGITIZE: Y'. The orifice numbers in Appendix VI correspond to axial and angular locations listed in Table 2.2 with the capital letter P's omitted.

For a guided tour in different regimes of the circular cylinder flow, readers are recommended to follow the $Cp - \theta$ plots arranged in Appendices I to IV in order of increasing Reynolds number. In case detailed experimental data are required, the RUN ID numbers located at the upper right corners of these plots point to the relevant pressure-distribution tables organized according to increasing run numbers in Appendix V. Open spaces at different angular locations of these tables correspond to pressure orifices for which data were deleted; they should coincide with open spaces in the plots as well as to bad sequences or bad orifices recorded in Appendix VI, with exceptions for the disabled pressure orifices discussed in the last paragraph.

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4.0 DISCUSSION

4.1 CIRCULAR-CYLINDER DRAG COEFFICIENT

The drag coefficients and lift coefficients listed in the tables of Appendix V were calculated numerically by trapezoidal integration in the following equations:

$$c_D = \frac{1}{2} \int_0^{2\pi} c_p \cos\theta \, d\theta$$

$$c_L = \frac{1}{2} \int_0^{2\pi} c_p \sin\theta \, d\theta$$

During the integration, any missing pressure coefficients c_p corresponding to a pressure orifice where data were deleted during the sampling operation were re-established approximately by linear interpolation. The sine and cosine functions in the integrand were calculated for the angular positions listed in the data file. In principle, the integration could have been carried out using more complicated formulas, but we believe that the trapezoidal rule is adequate for present purposes. The drag coefficients calculated for configurations 1 to 4 are plotted in Figures 4.1 to 4.4, respectively.

As shown in Figure 4.1, the present smooth-cylinder data agree very well with Szechenyi's data at Reynolds numbers well above critical. However, the critical Reynolds number in the present experiment is appreciably higher, agreeing well with the best experience of the accumulated literature. The difference in the critical Reynolds numbers may be caused by a difference in free-stream turbulence level. The free-stream turbulence level of the wind tunnel was 0.04% at $Re_D = 0.32 \times 10^6$

21

and 0.08% at $Re_D = 6.3 \times 10^6$.

4.2 CONFIGURATION 1 (Smooth Cylinder)

The numerous measurements made in and near the critical range of Reynolds number for the smooth cylinder were carried out primarily to serve the purposes of a different investigation. Three Mach numbers are represented; 0.05, 0.15, 0.25. No unsteady data were recorded except at the highest Mach number, where the dynamic pressures were relatively large (Runs 5-23 and 91-94, with some deletions). However, the drag data at lower Reynolds numbers serve to connect the present experiments effectively to the previous literature of the subject.

For the smooth cylinder, changes in the flow near the critical Reynolds number are very abrupt and dramatic. In the range 0.33×10^6 to 0.35×10^6, the pressure distributions are typical of subcritical flow and the drag coefficients are close to unity (runs 34, 35, 36 at $M_\infty \sim 0.15$; run 82 at $M_\infty \sim 0.05$). These data are relatively ragged, partly because the pressure transducers were working at a small fraction of full scale, and partly because tunnel regulation over the 5-minute run period was poor at the lower Mach numbers.

In the narrow Reynolds number range 0.36×10^6 to 0.38×10^6 the pressure distributions are strongly asymmetric. It is likely that transition occurs earlier in one of the detached shear layers, so that turbulent reattachment occurs on one side of the cylinder but not on the other. This situation, once extablished, tends to persist. In the narrow range specified, the flow appears to be essentially bistable, given the model and tunnel conditions of the present test. Similar behavior, including hysteresis, has been reported by Bearman (1969) and by Schewe (1983). The present measurements were recorded during a period of a few seconds at intervals of

about one minute, during which the model was rotated. In some cases both states were unambiguously recorded (runs 61, 63) and in other cases the flow remained in one state for the entire duration of the measurements (runs 75, 76, 78). At nearby Reynolds numbers, a number of noisy runs had to be discarded; presumably the state was changing during the measurements.

In the Reynolds-number range of 0.40×10^6 to 0.54×10^6, the data are vary clean and symmetric and the drag coefficients have their lowest values. Some influence of Mach number can be resolved in this range, not necessarily in the drag coefficient, but in the minimum pressure coefficient, which tends to be located at about $\pm 90°$ from the front stagnation line. Some data are extracted in Table 4.1.

TABLE 4.1 EFFECTS OF MACH NUMBER ON THE MINIMUM PRESSURE COEFFICIENT

Run #	M_∞	Re_D	$c_p min$	$(1-c_p min)$	M	c_D
53	0.07	0.47×10^6	- 2.79	1.95	.136	0.195
44	0.15	0.47×10^6	- 2.37	1.84	.275	0.175
71	0.07	0.48×10^6	- 2.80	1.95	.136	0.222
22	0.24	0.51×10^6	- 2.26	1.81	.433	0.192
52	0.08	0.52×10^6	- 2.71	1.93	.154	0.180
72	0.08	0.54×10^6	- 2.71	1.93	.154	0.178

The local Mach numbers in Table 4.1 were obtained by multiplying M by $(1-c_p min)^{1/2}$, which is equal to u/U_∞ according to Bernoullis' equation for an inviscid incompressible flow. Incompressibility is an acceptable approximation for the present calculation since the local Mach numbers are all reasonably low (M< 0.5).

Although the Reynolds number for the runs listed in Table 4.1 are all in the same neighborhood, the Mach numbers for run 22 and run 44 are significantly higher than for the other runs. The absolute values of the minimum pressure coefficients for these two runs are also significantly smaller. For example, the Reynolds numbers of run 53 is identical to that of run 44 which has, however, much smaller $| c_{pmin} |$. Similar comparison can be made between run 52 and run 22 with a more pronounced effect.

The reduction of $| c_{pmin} |$ for runs 22 and 44 is not attributable to the compressibility effect, which requires $| c_p |$ to increase with Mach number, according to the Prandtl - Glauert rule. Instead, the effect of compressibility may have affected boundary-layer separation from the surface of the circular cylinder, resulting in a change in the pressure distribution.

Finally, in the Reynolds-number range 10^6 to 3×10^6, there is a tendency for the pressure-distribution to again become slightly asymmetric and somewhat noisy; see runs 12, 14, 15, 16 and 98 for examples. The reason is believed to be asymmetric movement of transition forward in the attached boundary-layers. This process must be exquisitely sensitive to small variations in shape and smoothness of the model surface (Schewe, 1986), especially as the model is rotated. The effect seems to disappear at about $Re_D = 5 \times 10^6$, although the drag coefficient still depends noticeably on Reynolds number.

4.3   CONFIGURATION 2   (k/D = 0.0003)

The data obtained with this configuration were of doubtful value. The screen was paper-thin, and it was difficult to get a good wrap on the model. The data fall into two groups. The higher drag coefficients represent a series of runs at $M_\infty \approx 0.25$. Some asymmetry in the

pressure-distributions occurs in the range of Reynolds number from 0.4×10^6 to about 1.5×10^6, probably because transition is moving asymmetrically upstream in the boundary layer. The lower drag coefficients represent a series of runs at varying and lower Mach numbers. It is not clear whether or not the discrepancies, which appear mainly in the base pressure, are a genuine effect of Mach number. It is more likely that the fine screen was not always in close contact with the cylinder model. The spanwise pressure distributions are ragged at Reynolds numbers below 1.8×10^6. Two dimensionality improves at higher Reynolds numbers.

4.4 CONFIGURATION 3 (k/D = 0.0012)

These are the premier data of the experiment, partly because of their consistency and partly because non-steady pressure measurements were made at several rotation angles for several Reynolds numbers. The only anomaly is a small but persistent asymmetry in the region of large negative pressure coefficient (preceding and including mean separation) amounting to about 0.15 in C_p at the lowest Reynolds numbers and to about 0.10 at the highest Reynolds numbers. The reason is unknown; it may be caused by asymmetry in the tunnel flow or it may be an effect of the screen in the base region. (The location of the seam in the screen was approximately 15 degrees below the rear stagnation line.)

4.5 CONFIGURATION 4 (k/D = 0.0101)

The most obvious property of these data for the roughest surface is the increase in spanwise coherence and in the intensity of the fluctuating lift forces. In fact, during the tests the forces were high enough to shake the tunnel noticeably, and the maximum pressure was reduced by about 20% to decrease the risk of damage. The data again fall into two groups; the larger drag values are all for M_∞ ᷄ 0.20, and the lower drag values at

higher Reynolds numbers are for varying M , as low as 0.06. Here is a slight asymmetry of about 0.05 in C_p for Reynolds numbers above $1X10^6$, for unknown reasons. There is no reason to believe that the decrease in C_D at this same Reynolds number is not real.

4.6 BASE PRESSURE COEFFICIENT

The pressure coefficients in the base (180°) region of the circular cylinder were plotted against the Reynolds number for four different roughness configurations in Figure 4.5.a–4.5.d, respectively. These data compare well with the base-pressure coefficients compiled by Guven (1975) in the Reynolds number range $3X10^5$ to $6X10^5$. For Reynolds numbers beyond $6X10^5$, the present results are the only data available in the literature.

For the case of the smooth cylinder, Figure 4.5.a shows a continual decrease of base pressure coefficient from -0.25 to -0.6 in the Reynolds number range $7X10^5$ to $8X10^6$. Similarly the base pressure coefficient for the least rough cylinder (k/D = 0.0003, Figure 4.5.b) dropped from -0.75 to -1.0 in the same Reynolds number range. Reynolds number independence of the base pressure coefficient, and of the time-averaged flow field, does not seem to appear before $Re_D = 8X10^6$ for these two configurations. As the roughness increases, however, Figure 4.5.c and 4.5.d show that the base pressure coefficient became independent of Reynolds number in the range beyond $\sim 2X10^6$ and 10^6, respectively.

The base pressure coefficients were also used to correlate drag data, as recommended by Roshko (Shih, 1981), in Figure 4.6. Results from free-streamline theories were also included for comparison. The present data fall onto two branches of curves similar to what the theory predicts for an open wake (0 > 90°) and for a closed wake (0 < 90°), respectively.

4.7 SEPARATION

The pressure rise ($c_p$base - $c_p$min) which is important for determining separation, is plotted against Reynolds number in Figure 4.7.a to Figure 4.7.d for the four different roughness configurations. The values of C_{pmin} used in calculating the pressure rise were obtained from the symmetrical runs by taking averages of the minimum pressure coefficients on the top and on the bottom of the circular cylinder.

Again, the Reynolds number independence of the pressure rise in the case of the smooth cylinder was not evident in the Reynolds number range investigated. It was for the rough cylinders that Reynolds number independence was confirmed. Moreover, the asymptotic values of the pressure rise seemed to decrease with relative roughness, as shown in Figure 4.7.b to 4.7.d.

The separation angle was obtained from the location where the pressure coefficient c_p has risen half way from $c_p$min to $c_p$base, as illustrated in Figure 4.8. Since the pressure distributions in these regions are usually pretty steep, the separation angle can be determined with good accuracy using the present approach.

As shown in Figure 4.9.a to 4.9.d, where the separation angles from the top as well as from the bottom of the cylinder were plotted together, Reynolds number independence of the separation angle was achieved for all four configurations during the Reynolds number range surveyed. The asymptotic values of the separation angle are all very close to 90 degrees except for the case of the smooth cylinder.

4.8 LIFT COEFFICIENT

Section lift coefficients are also listed in Appendix V. Values different from zero label the runs in which the mean flow was asymmetric.

Of particular interest is run 78, where the pressure distribution was non-symmetric and the sectional lift coefficient obtained from the experimental data was 1.6. The minimum pressure coefficient for this run was -3.8, lower than the theoretical minimum of -3.0 corresponding to the potential flow around a circular cylinder with zero circulation.

Using a potential flow model, the amount of circulation required for $c_{p}min$ to become -3.8 at an angle of 270°, for example, gives a sectional lift coefficient of 1.2, comparing well with the experimental result of 1.6 cited above.

The asymmetry of this flow ($Re_D = 3.6 \times 10^5$) might have been triggered by certain minute differences existing on the cylinder surface which affected the boundary layer separation and re-attachment processes occurring on the top and the bottom of the circular cylinder. This is consistent with the critical Reynolds number range ($2 \sim 5 \times 10^5$) where the re-attachment phenomena were reported in the literature to be important (Shih, 1981).

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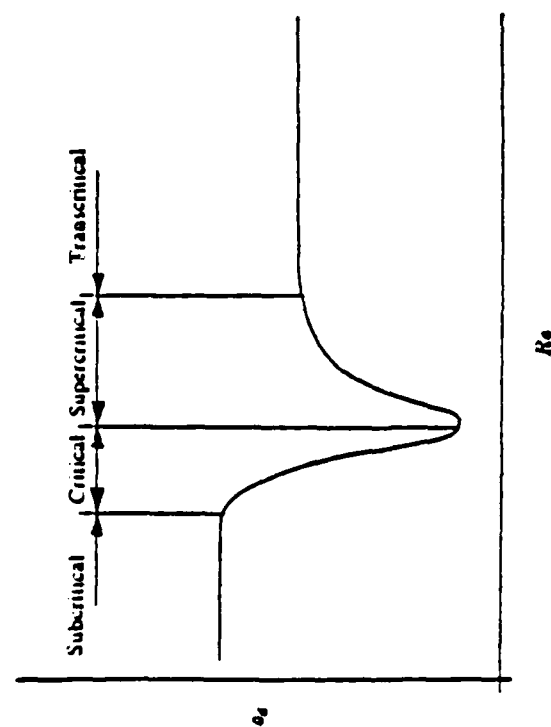
Smooth Cylinders

Subcritical   - Re < 2×10^5

Critical   - 2×10^5 < Re < 5×10^5

Supercritical - 5×10^5 < Re < 3.5×10^6

Transcritical - Re > 3.5×10^6

Figure 1.1 Flow Regimes for Flow Past Smooth Circular Cylinders.

31
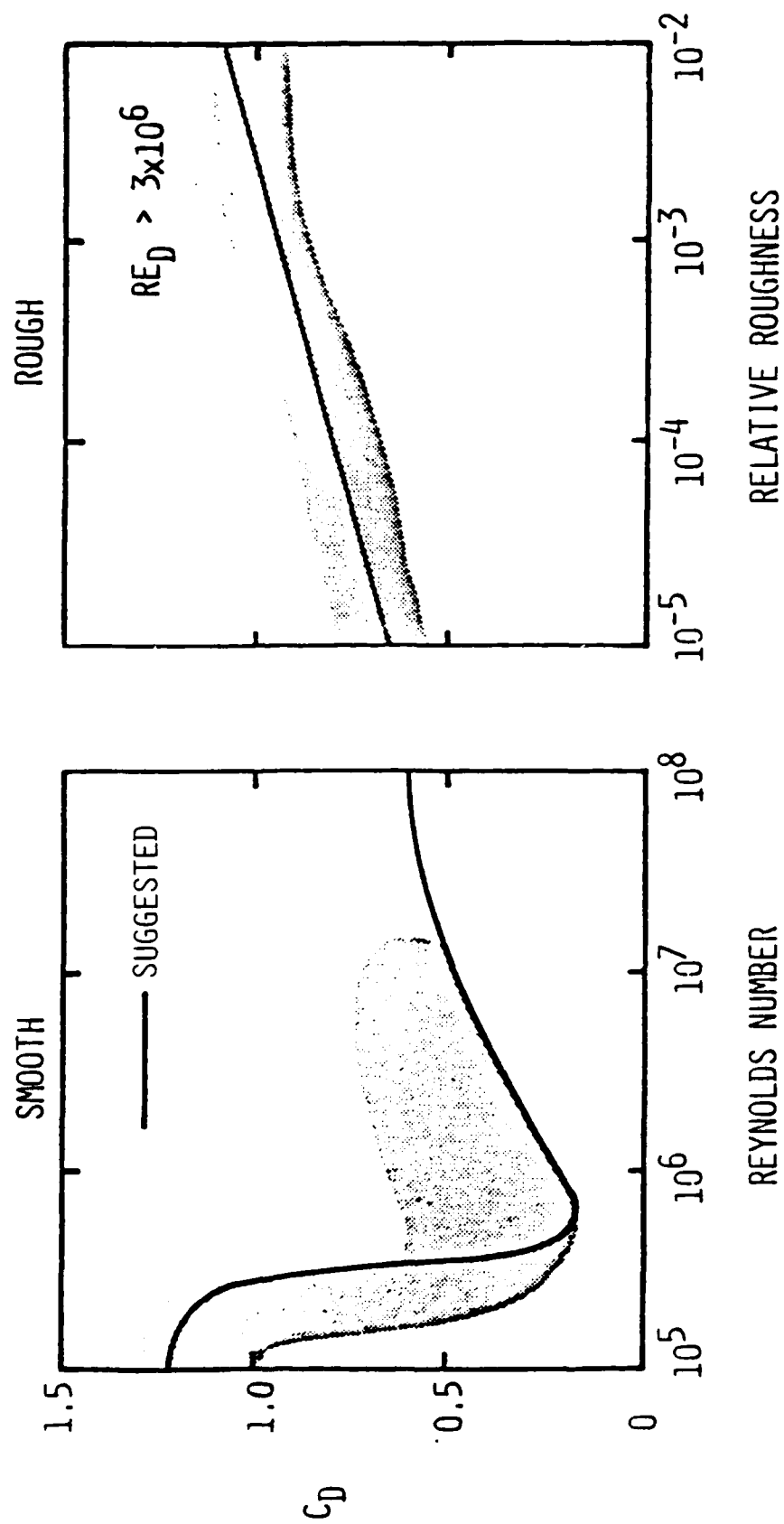
Figure 1.2 Cylinder Mean Drag Coefficients.

RELATIVE ROUGHNESS (k/D)

CYLINDER REYNOLDS NUMBER
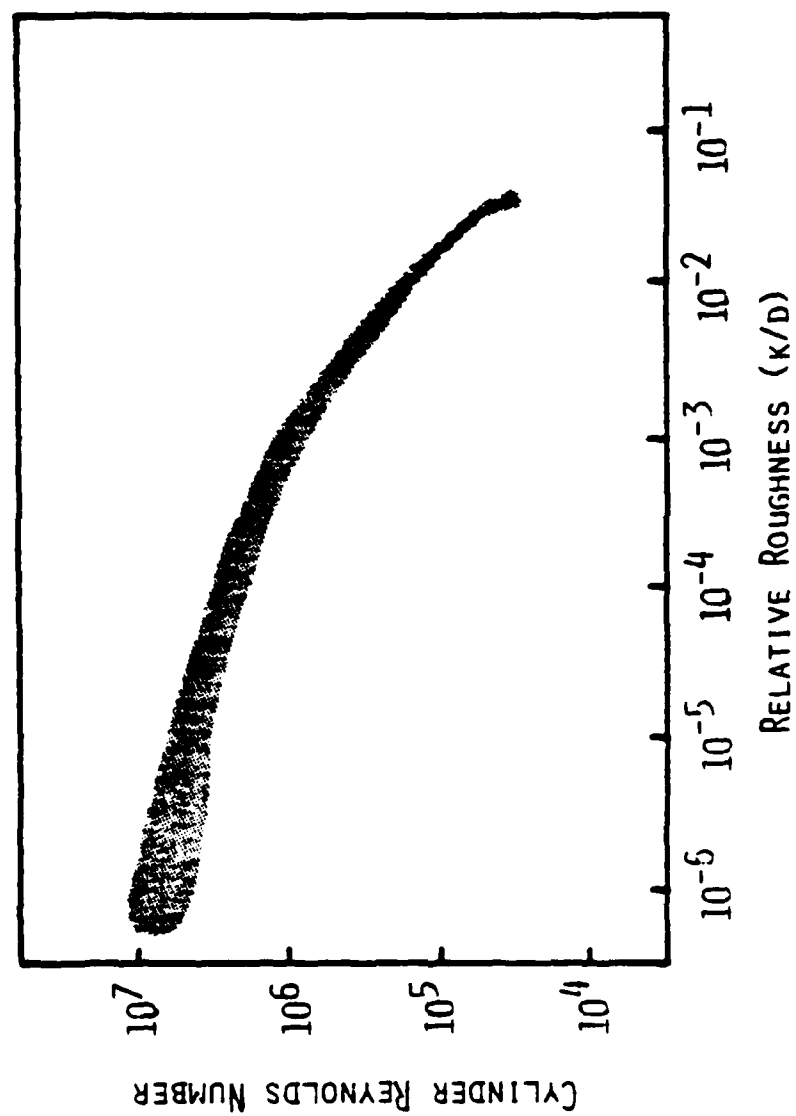
Figure 1.3 Reynolds-Number-Independence Criterion.

Figure 3.1 Smooth Circular-Cylinder Experiments Conducted in the NASA Ames 12-foot Wind Tunnel.
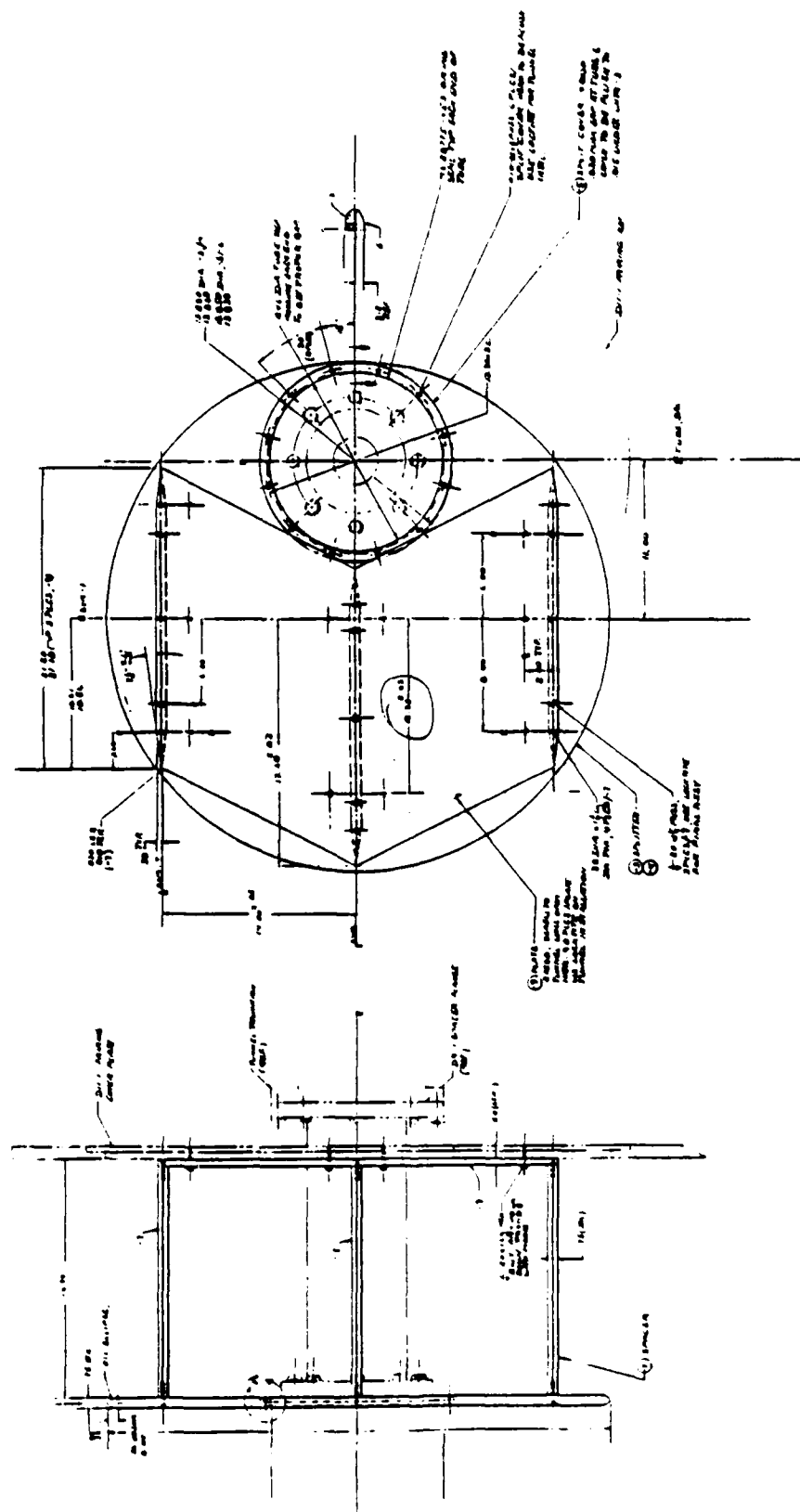
Figure 2.2   Boundary Layer End Plate.

Fig. 2.3 Rough Circular-Cylinder Experiments Conducted in the NASA Ames 12-foot Wind Tunnel.
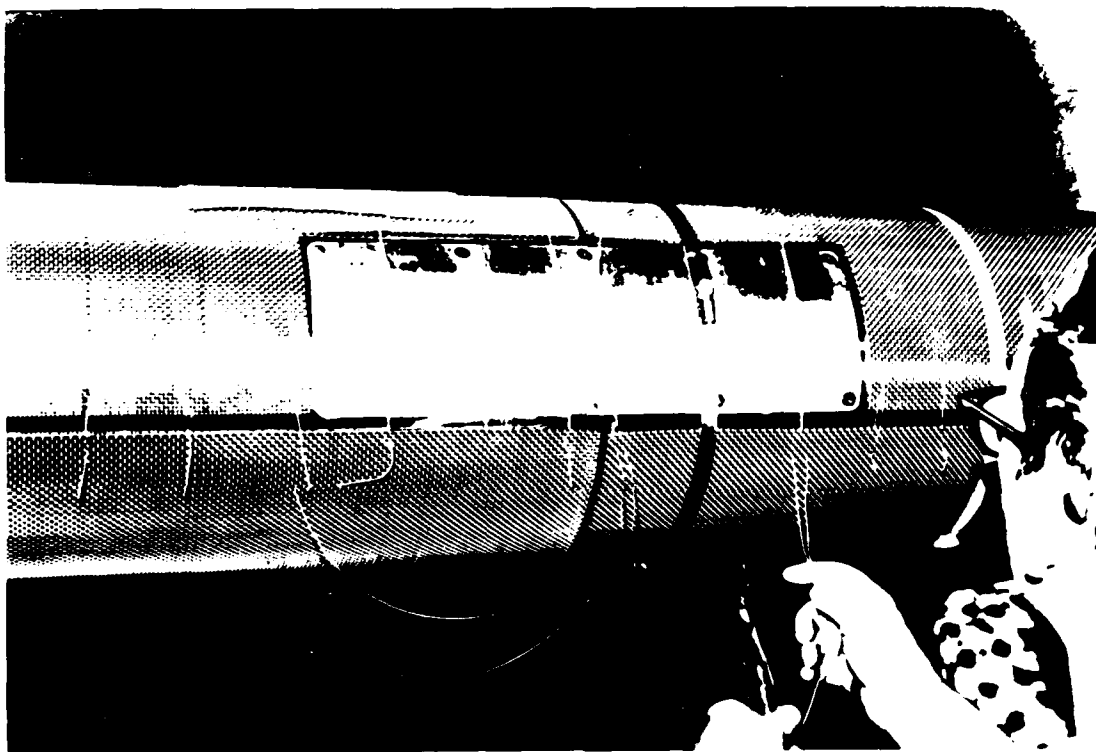
Fig. 2.4 Screens Secured With Safety Wires Were Wrapped Around the
Circular-Cylinder to Simulate Roughness.
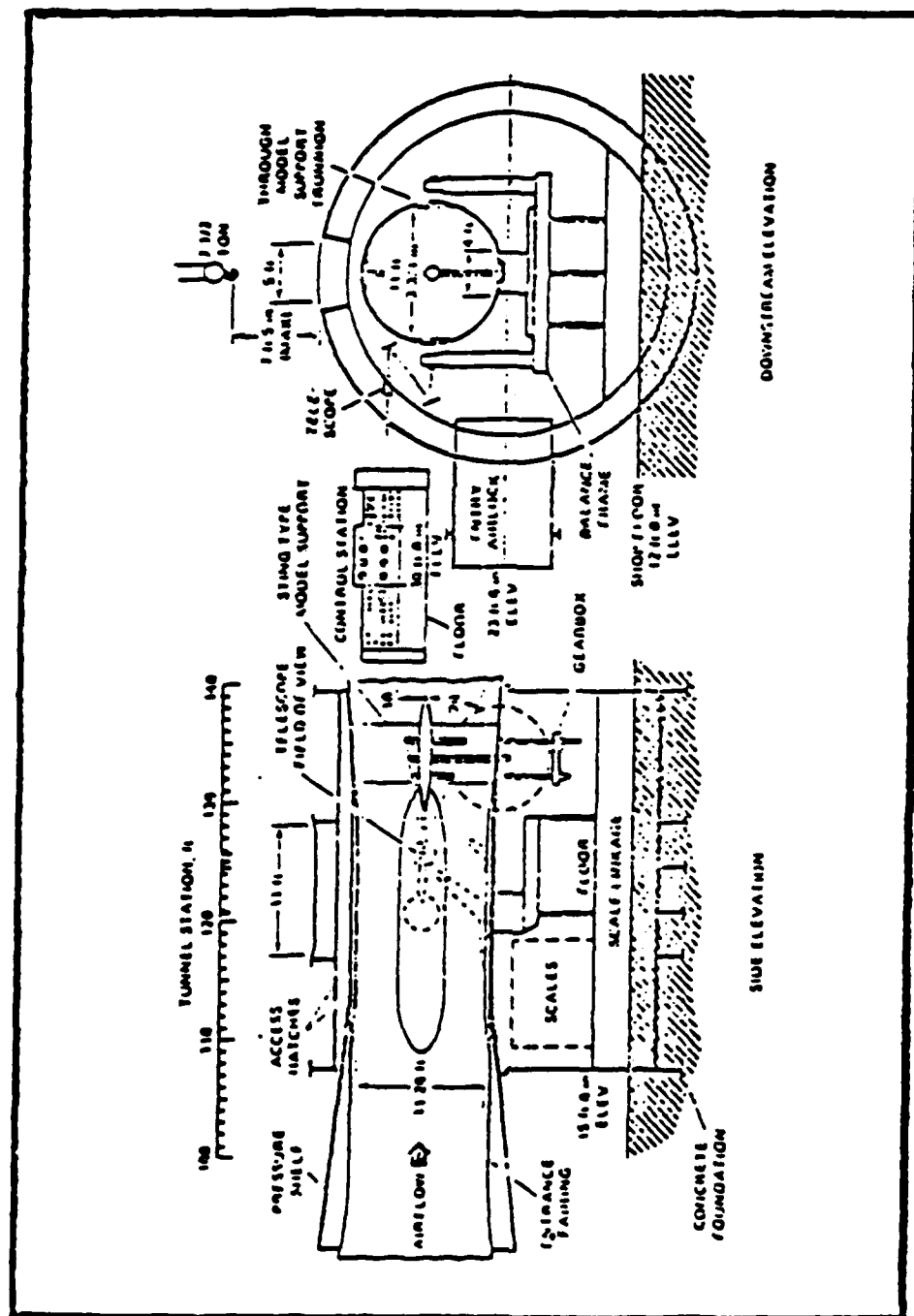
Figure 2.5 Test Section of NASA Twelve-Foot Pressure Wind Tunnel.
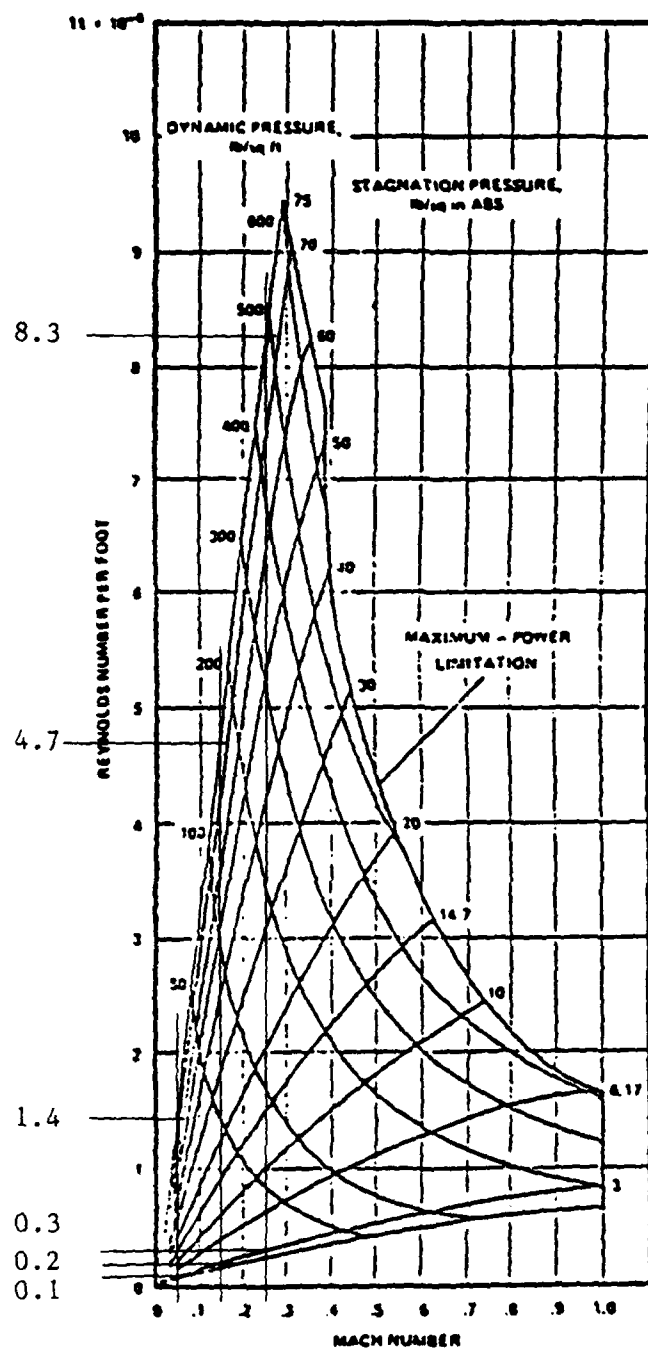
Figure 2.6   Operating Envelope for NASA Twelve-Foot
Pressure Wind Tunnel.

C

B　　D

D = 12.46 inches

DOOR

A　A　A　A　A　A　A　A

X
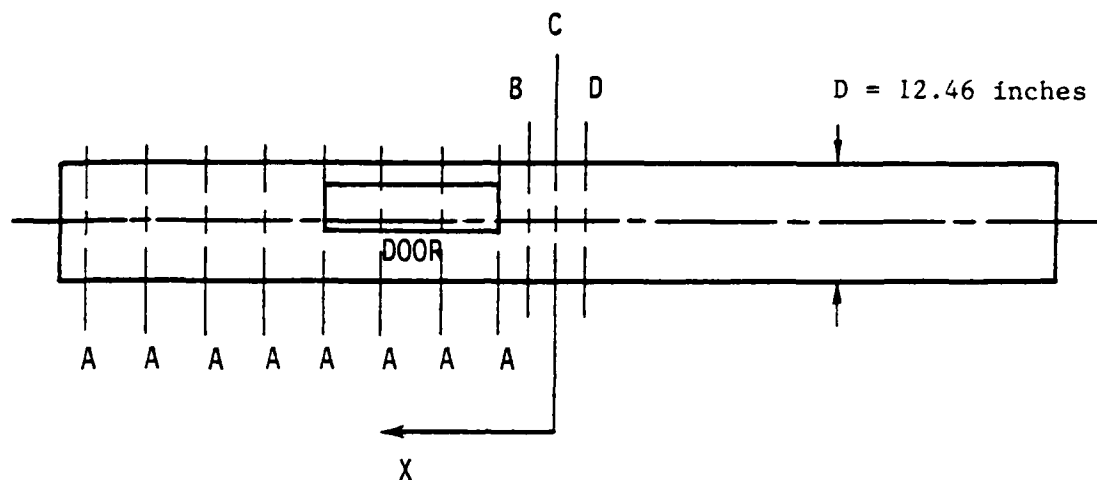
Figure 2.7.a　Instrumentation Location . (Looking Upstream)

FLOW

C　D　C
C　　　D　C
D　　B　　D
C　　B　　A　　30°　　30°　　A
D　　　30°　　　B
C　　　　　30°
D　　　B　　30°　　C
C　　B　　A　　30°　19°　　D
C　　　6°　4°　20°　B
D　　11°
B　　　20°
C　　30°
D　　30°
C

56 DEG
ACCESS DOOR

C
D
C
B
D
C
D
C

C　D
C　D　D　C　C
C　D　C

A – Static Taps
　　on Generator
B – Hot Wires (Not used)
C – Static Taps
　　at Midspan
D – Nonsteady Taps
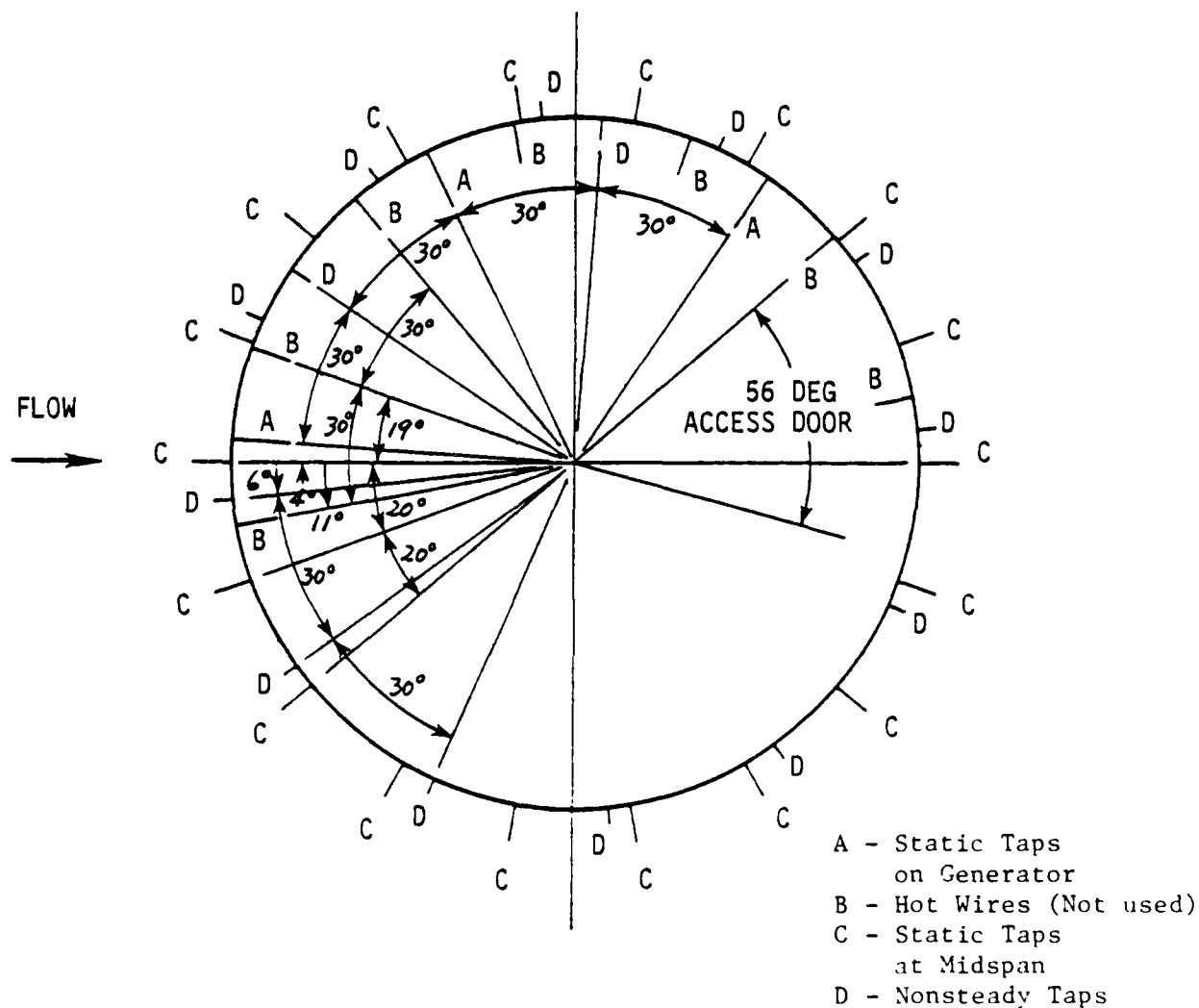
Figure 2.7.b　Instrumentation Location . (End View)

40

Fig. 2.8 A Kulite Pressure Transducer.
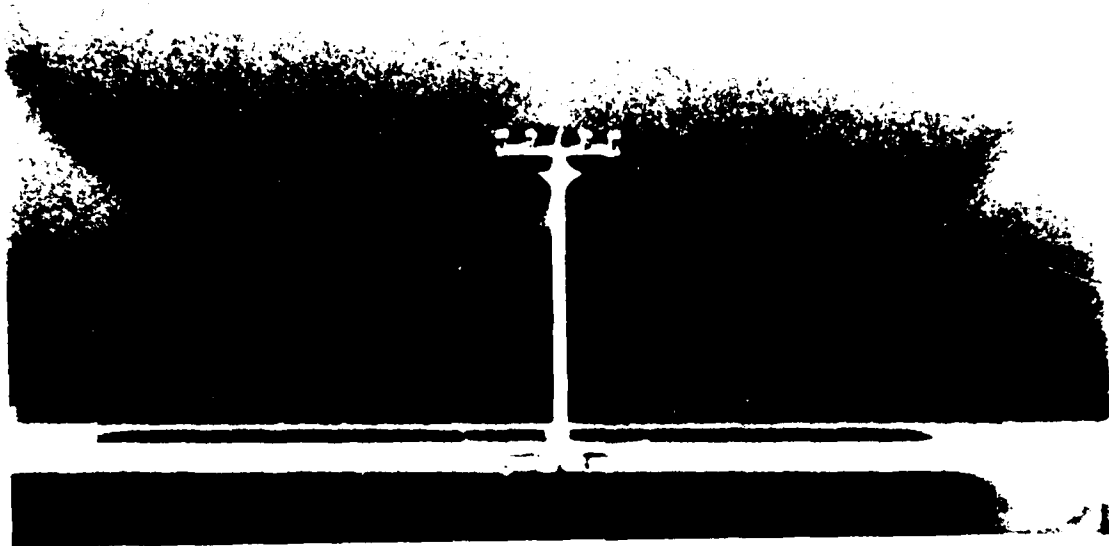
Fig. 2.9.a   The Boundary-Layer Probe, Front View.

Fig. 2.9.b   The Boundary-Layer Probe, Slanted View.
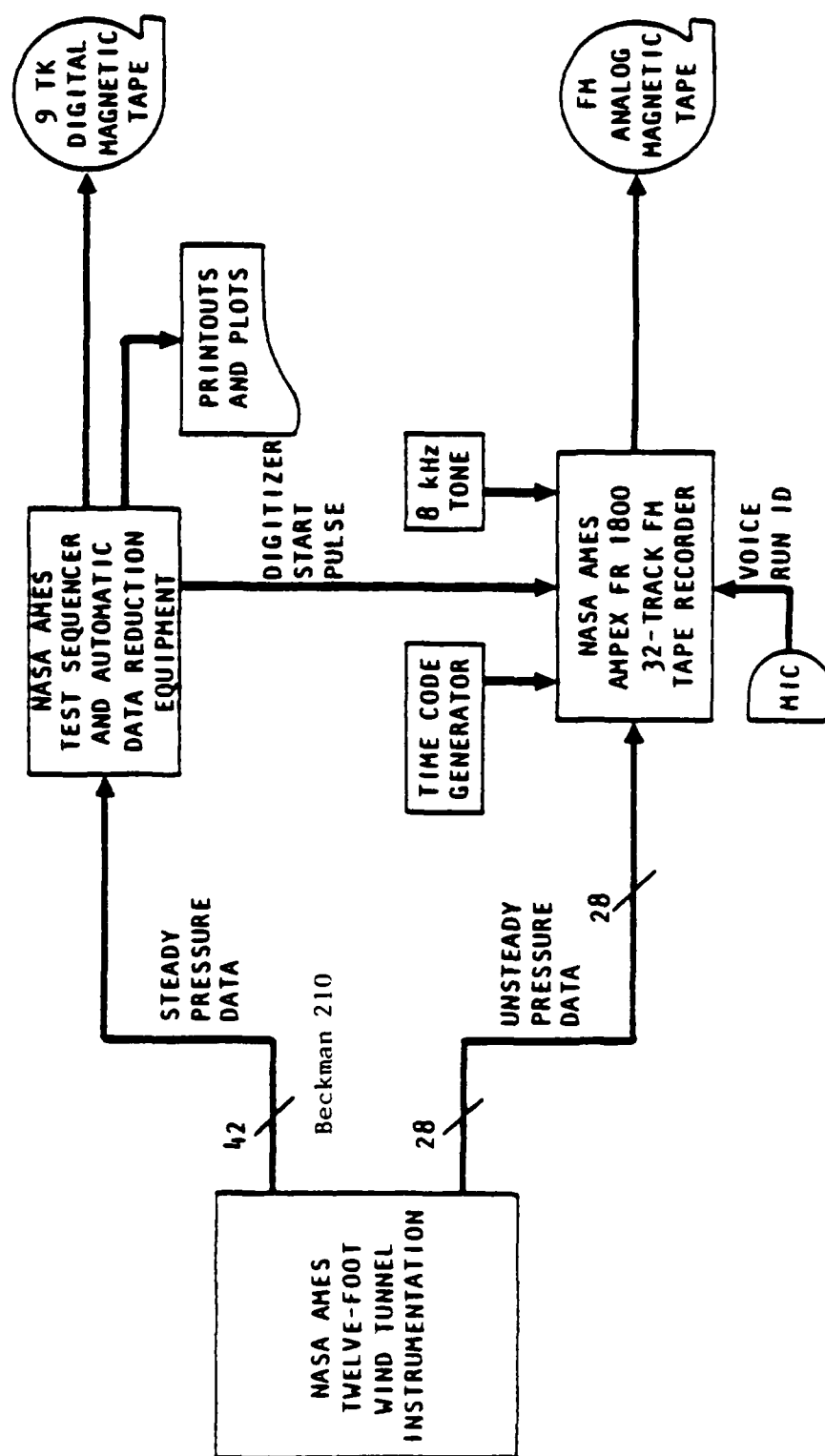
Figure 2.10 Primary Data Acquisition System.

43

0   RUN:SEO
    13413

0

CUNF	ALPHA	PT	MIU	QIU	PIU	VIU	TFIU	MM/LIU	NMD1U	TTF	TTR	DATE	TIME
4	4.55	610.7	0.204	178.2	6134.	230.84	75.2	4.032	4.187	79.6	539.3	528	2257

PRESSURE COEFFICIENTS REFERENCED TO QIU

P102	0.9186	P103	0.8400	P104	0.6231	P105	0.8412	P106	0.8400	P107	0.8352	P108	0.8388	P109		P110	0.8447
P111	0.2248
P202	-0.5635	P303	-1.4762	P304	-1.4369	P305	-1.5906	P306	-1.4535	P307	-1.4404	P308	-1.4249	P309	-1.4392	P310	-1.4251
P211	-1.2081
P402
P411	-1.0411
P502	-1.0498	P503		P504		P505	-1.0640	P506	-1.0391	P507	-1.0130	P508	-1.0557	P509	-1.0318	P510	-1.0127
P602	-1.1271
P603	-1.0913
P604	-1.0723
P605	-1.0282
P606	-1.0127
P607	-1.1490
P608	-1.5412
P609	-0.9305
P610	0.1597
P211	0.8924

Figure 2.11   Standard NASA Ames Transmittal Tape Format.

44

Time Re

1741   1.02
1743   1.03
1744   1.03
1745   1.03
1746   1.03

Run 232
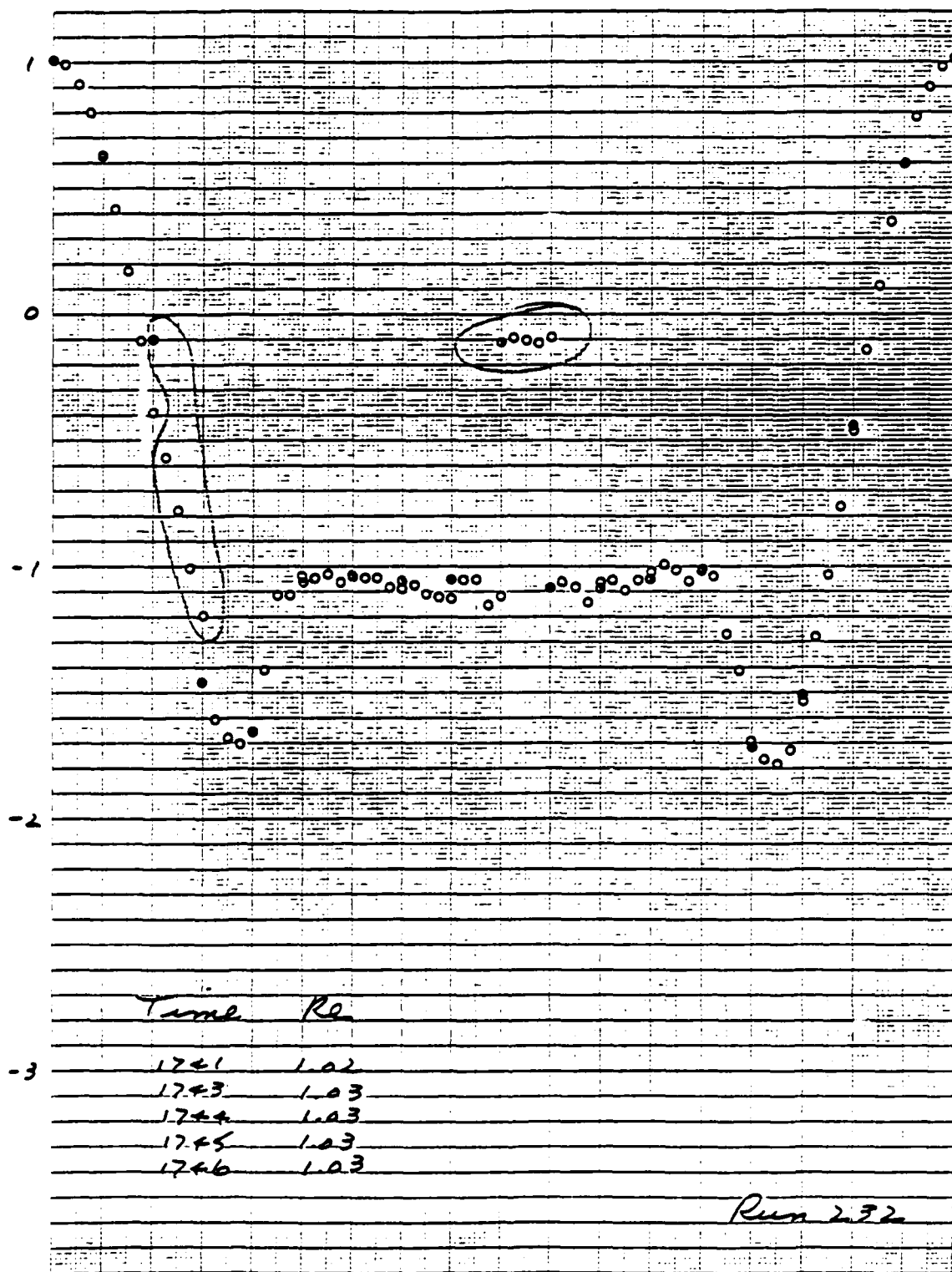
Figure 3.1   Circled data were deleted. (original from Dr. Coles)

Figure 3.2 Flow with Two Different Modes.

•   Seq. 1, 2

o   Seq. 3, 4, 5

46

Figure 3.3   Flow Showing Steady Non-Symmetric Pressure Distribution.
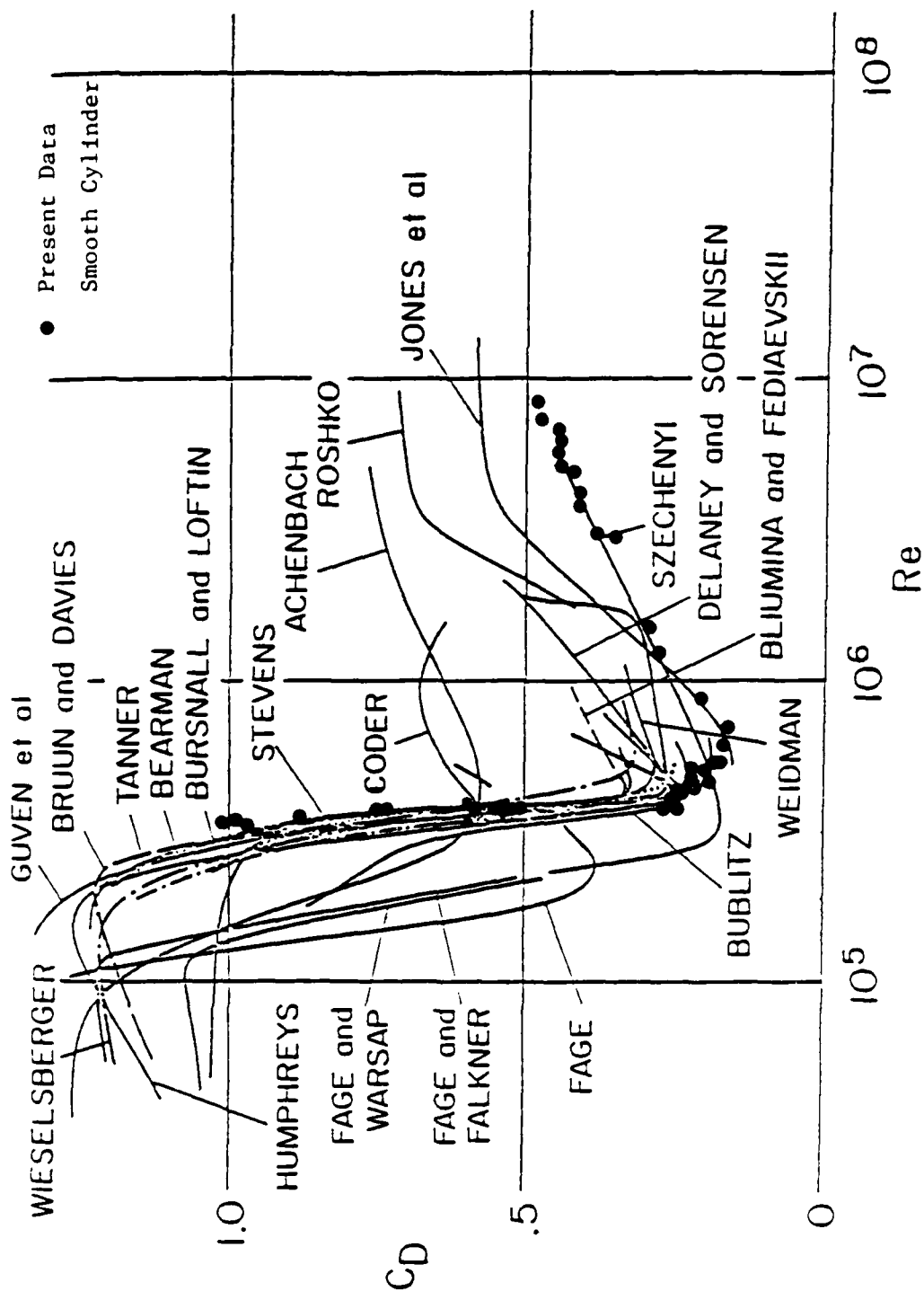
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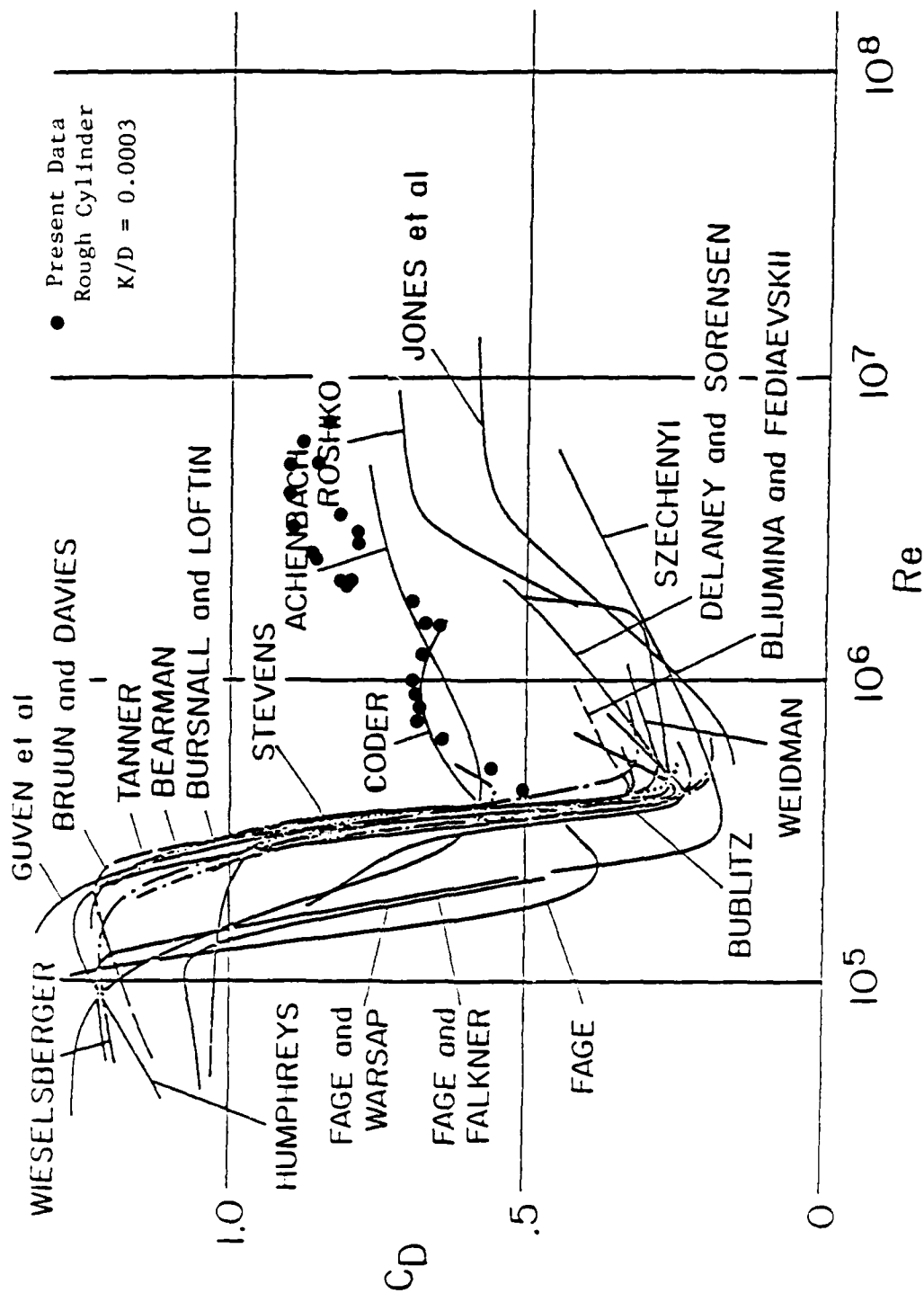
Figure 4.2

Figure 4.3

50
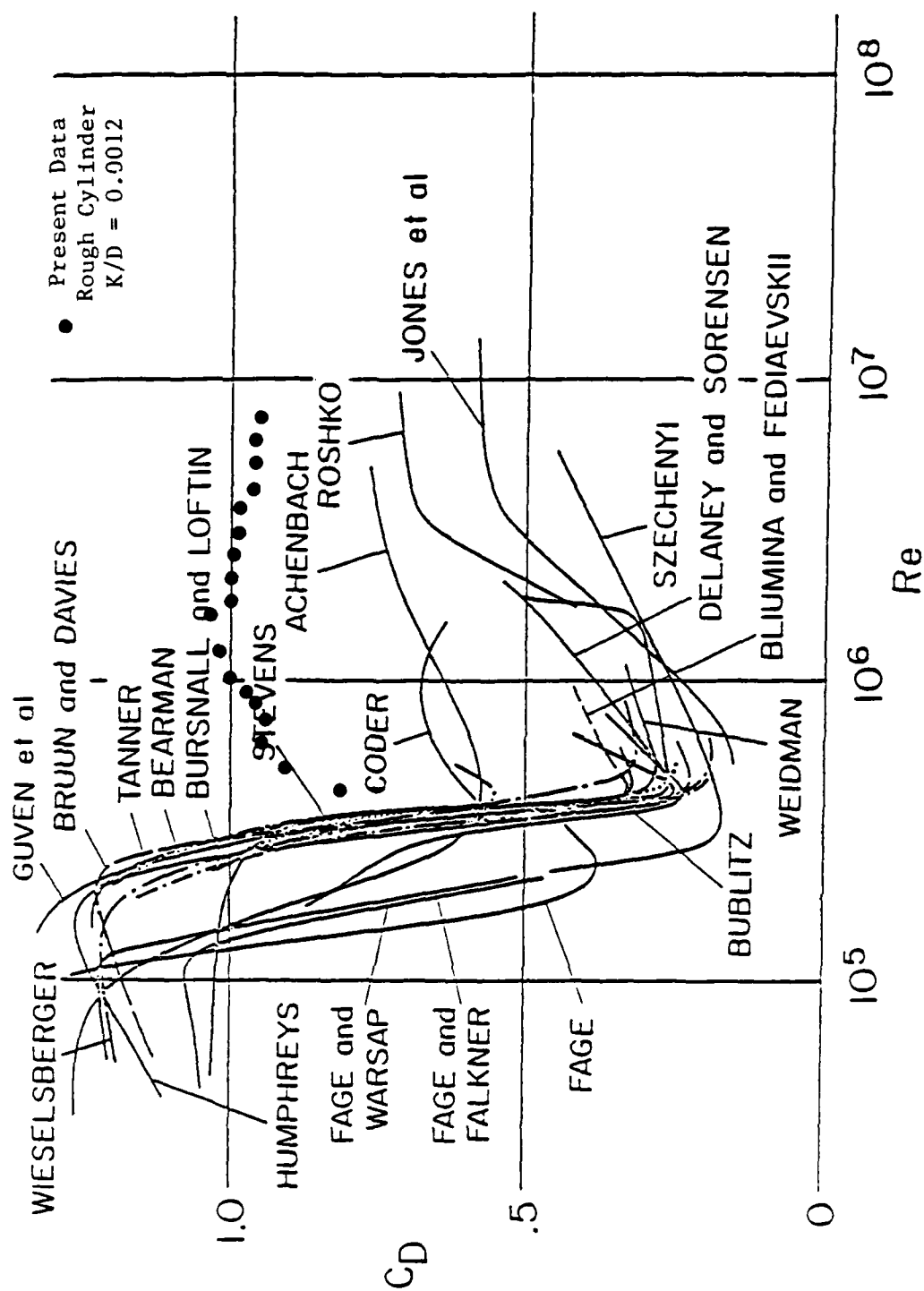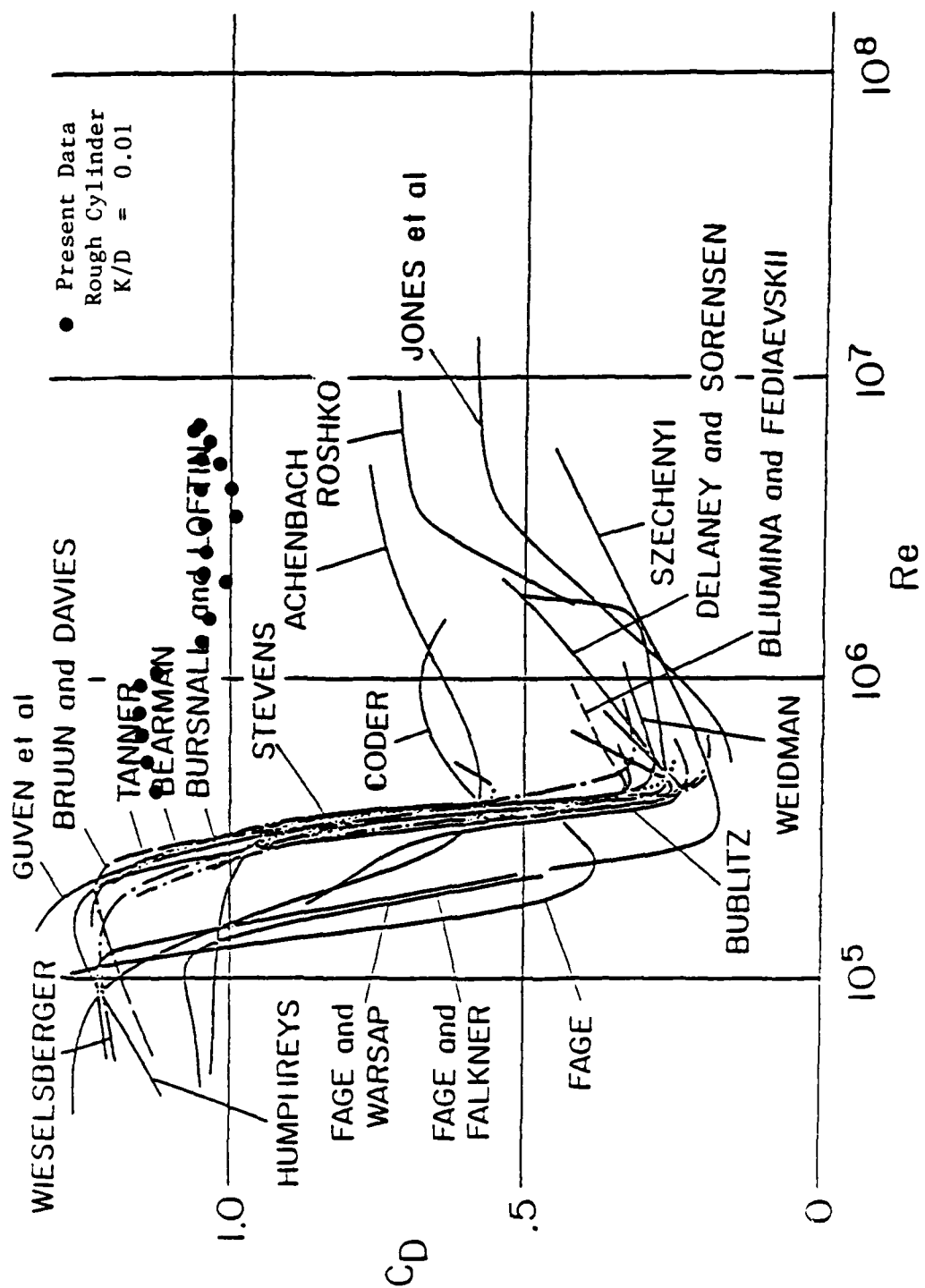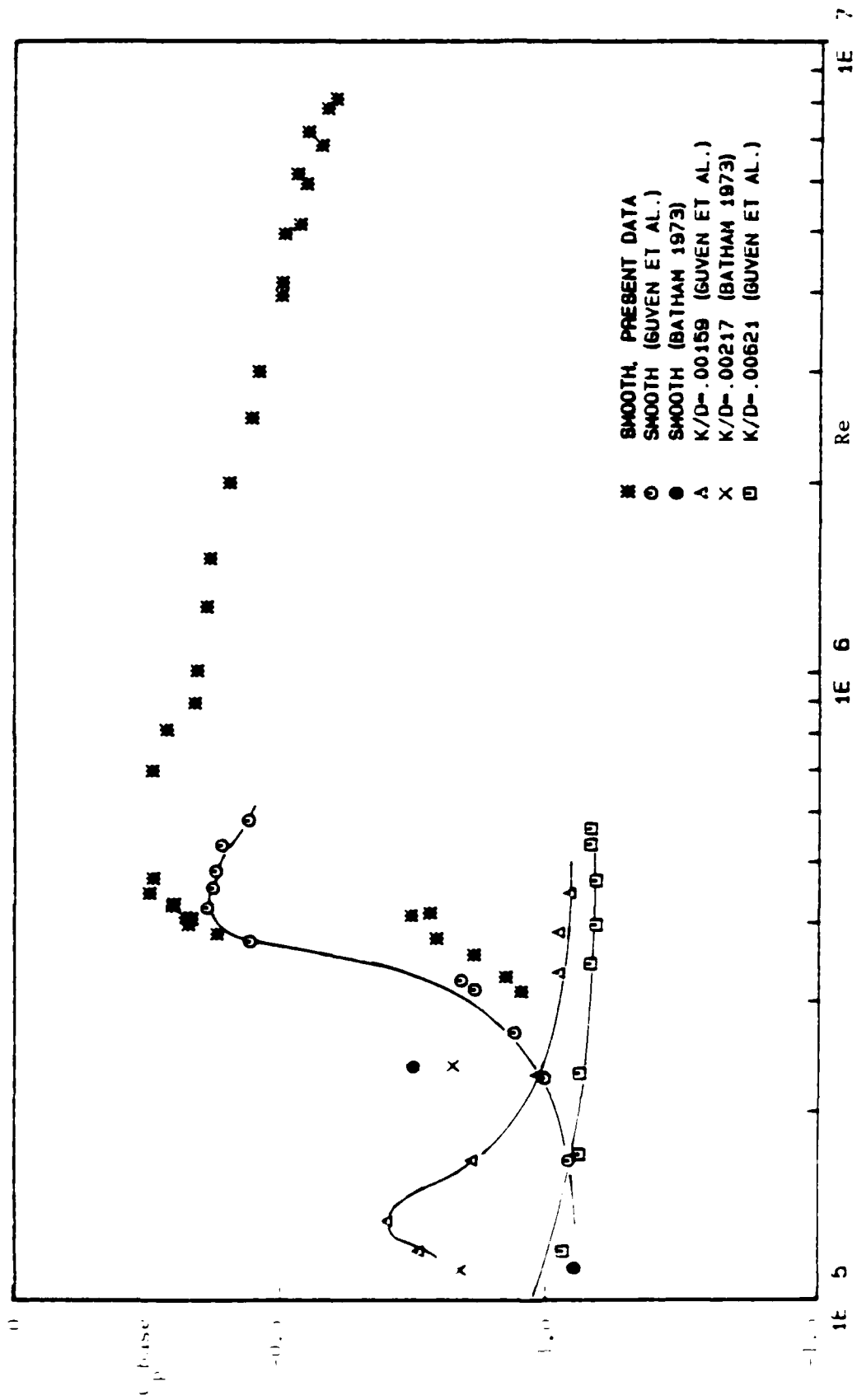
Figure 4.4

Figure 4.5.a   Variation of Base Pressure with Reynolds Number, Smooth Cylinder.

Legend:
* SMOOTH, PRESENT DATA
⊙ SMOOTH (GUVEN ET AL.)
● SMOOTH (BATHAM 1973)
△ K/D=.00159 (GUVEN ET AL.)
✕ K/D=.00217 (BATHAM 1973)
▣ K/D=.00621 (GUVEN ET AL.)
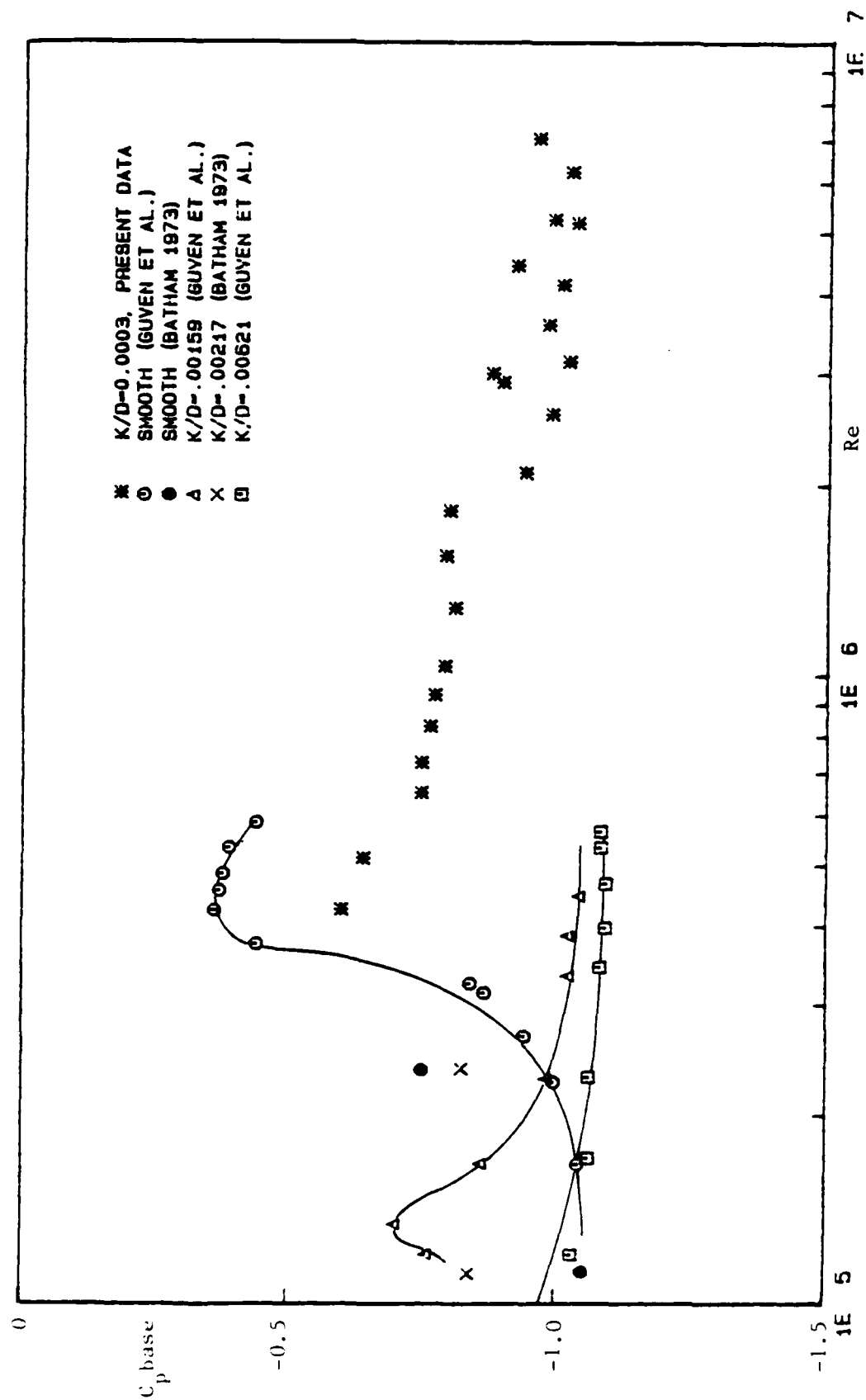
Figure 4.5.b   Rough Cylinder, K/D = 0.0003.

53
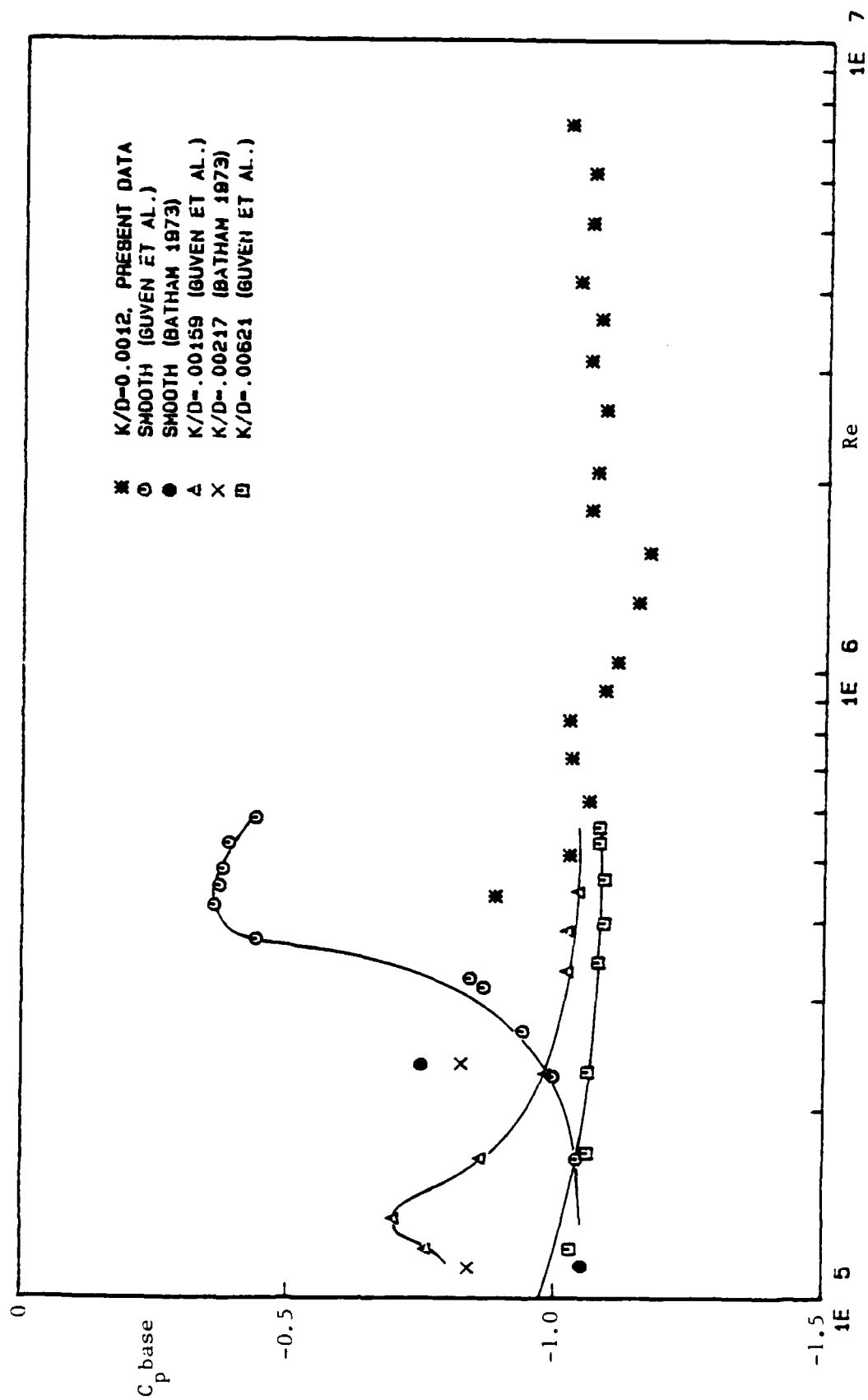
Figure 4.5.c Rough Cylinder, K/D = 0.0012.
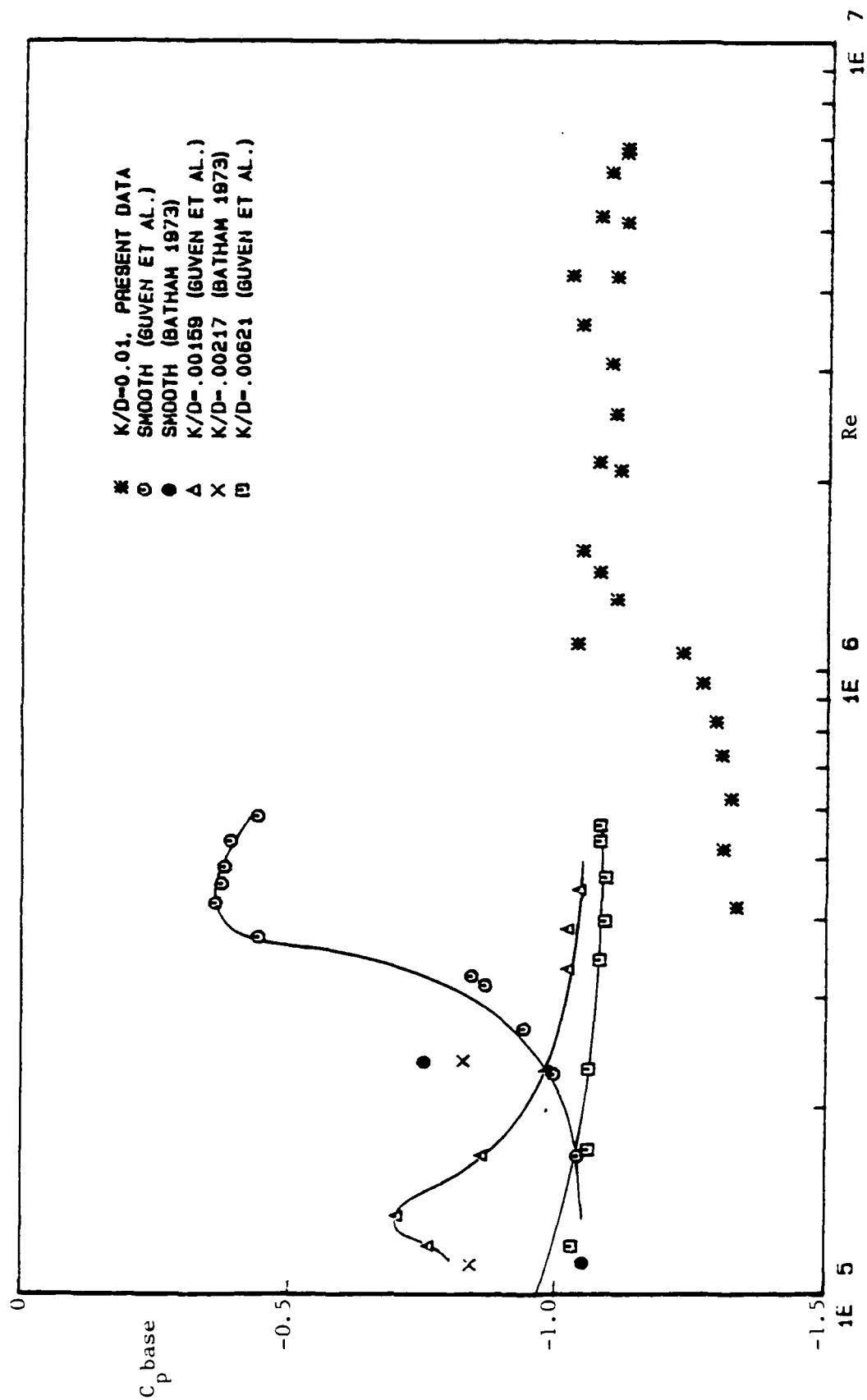
Figure 4.5.d   Rough Cylinder, K/D = 0.01.

55
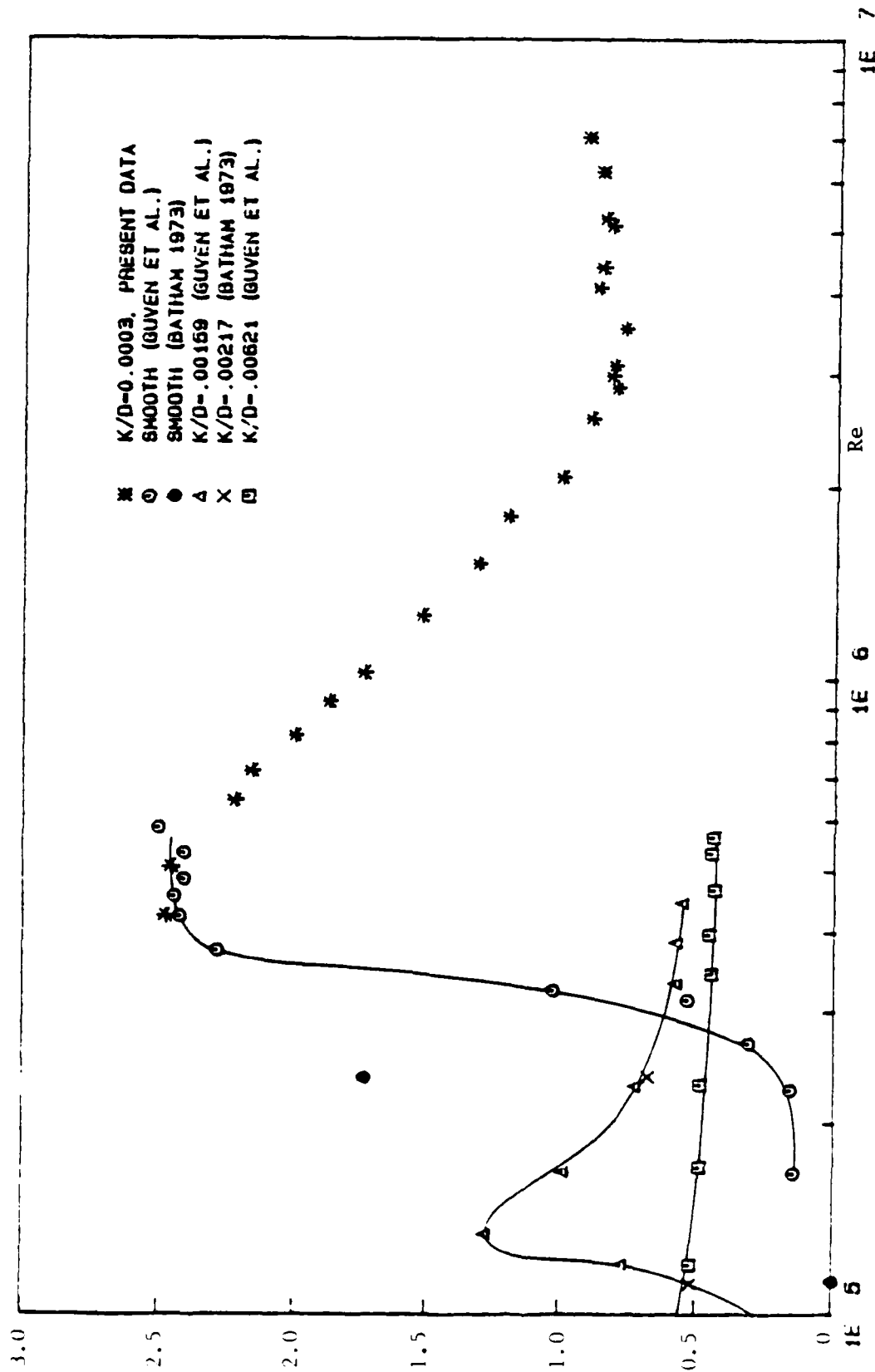
Figure 4.7.b   Rough Cylinder, K/D = 0.0003 .

58
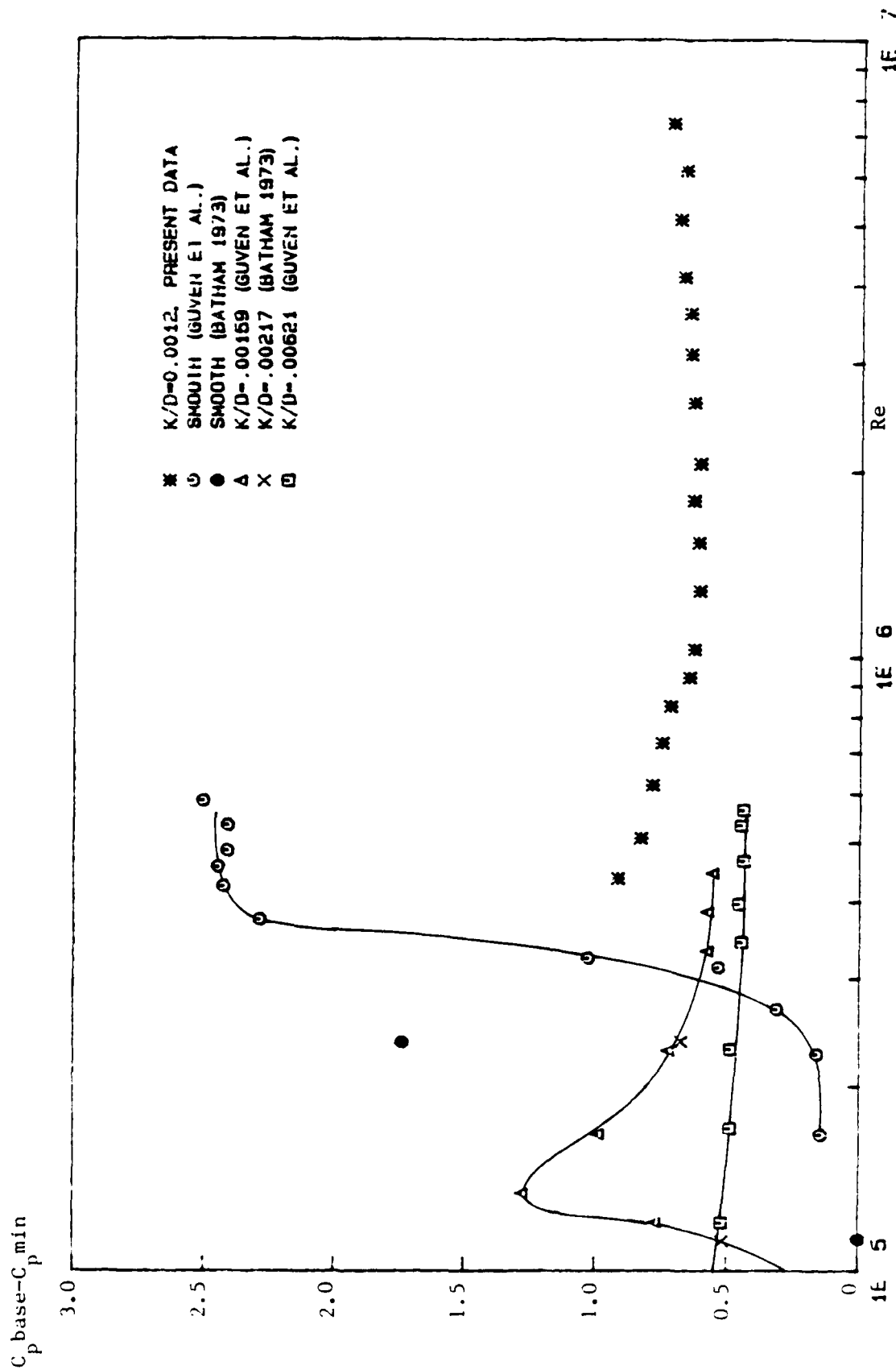
Figure 4.7.c   Rough Cylinder, K/D = 0.0012.

59

C_p base $- C_p$ min

Legend:
- ✳ K/D=0.01, PRESENT DATA
- ⊖ SMOOTH (GUVEN ET AL.)
- ⊙ SMOOTH (BATHAM 1973)
- △ K/D=.00159 (GUVEN ET AL.)
- ✕ K/D=.00217 (BATHAM 1973)
- ⊟ K/D=.00621 (GUVEN ET AL.)

Re
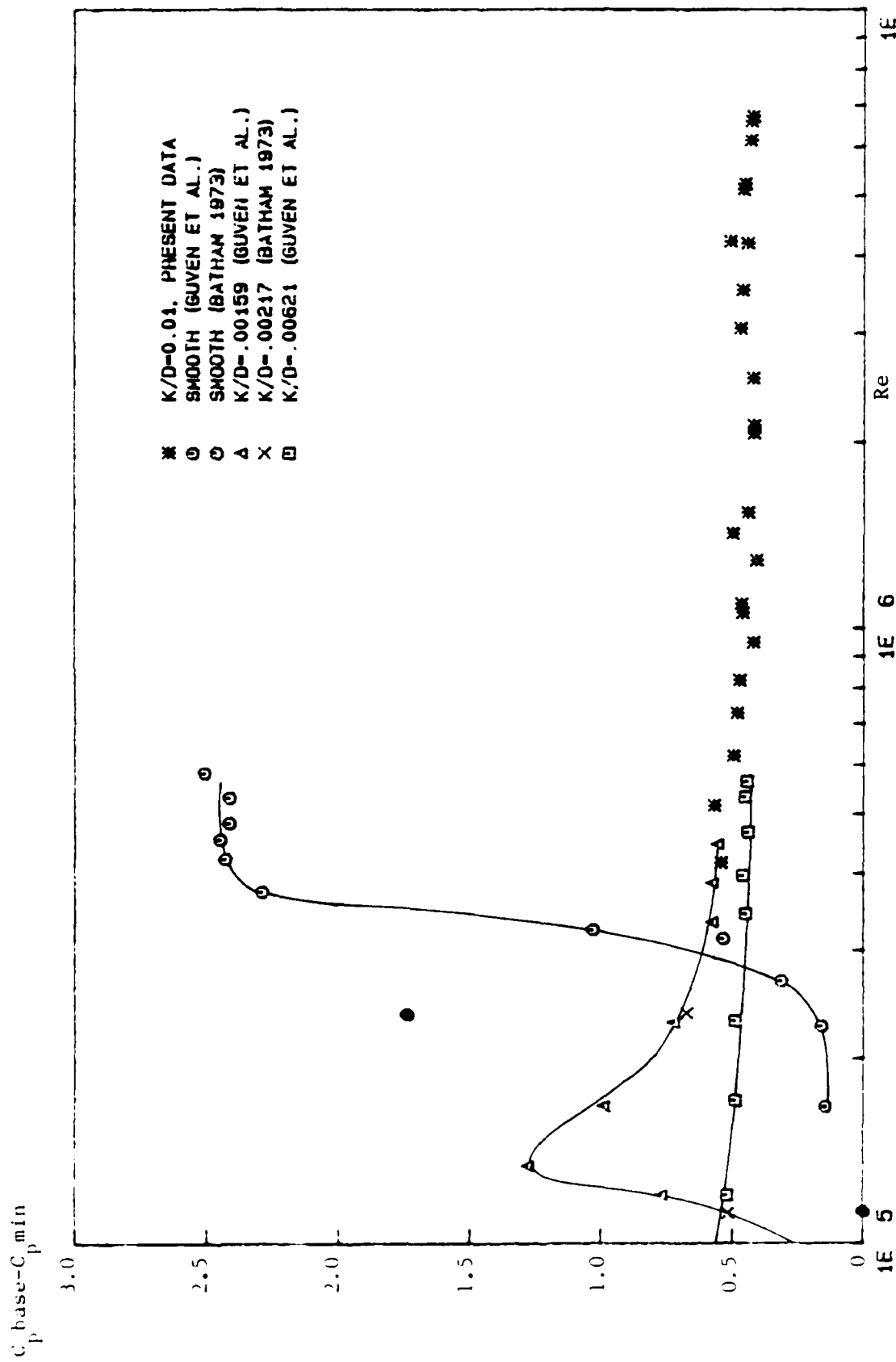
Figure 4.7.d   Rough Cylinder, K/D = 0.01.
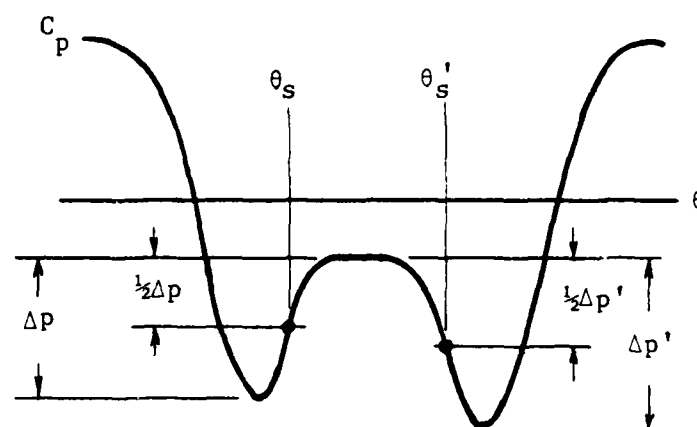
Figure 4.8   Definition of Separation Angle.
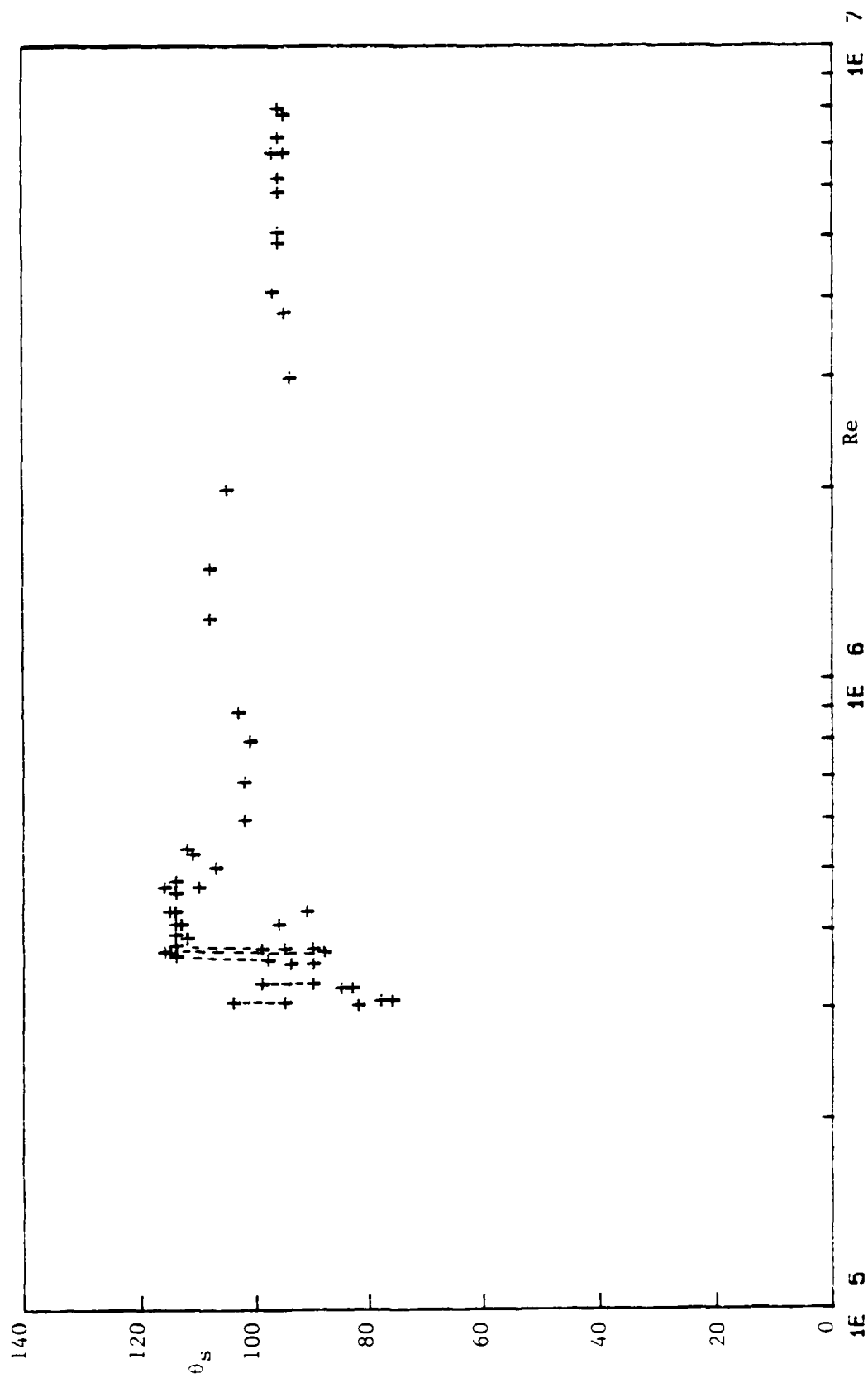
Figure 4.9.a   Variation of Separation Angle with Reynolds Number, Smooth Cylinder
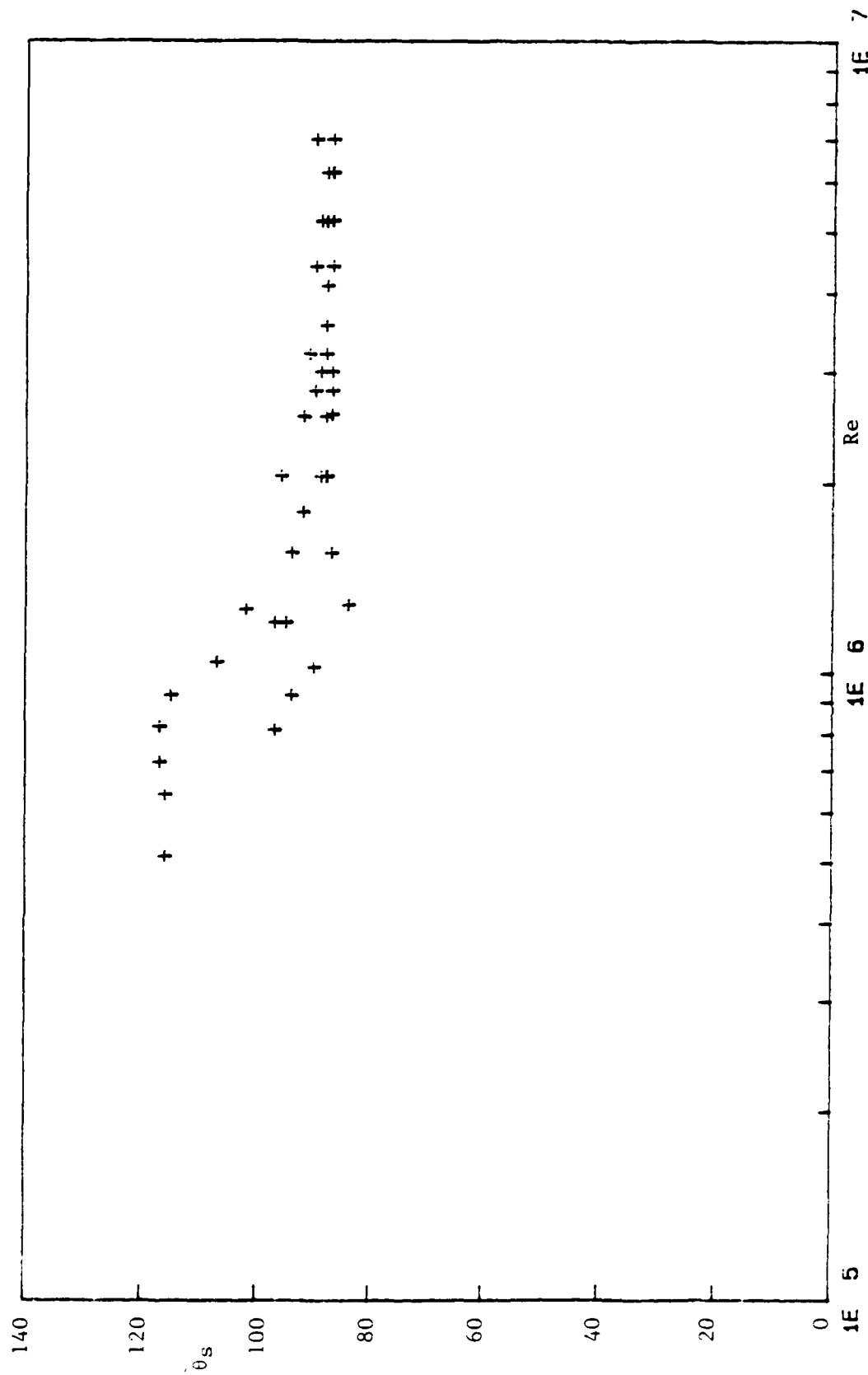
Figure 4.9.b   Rough Cylinder, K/D = 0.0003

63
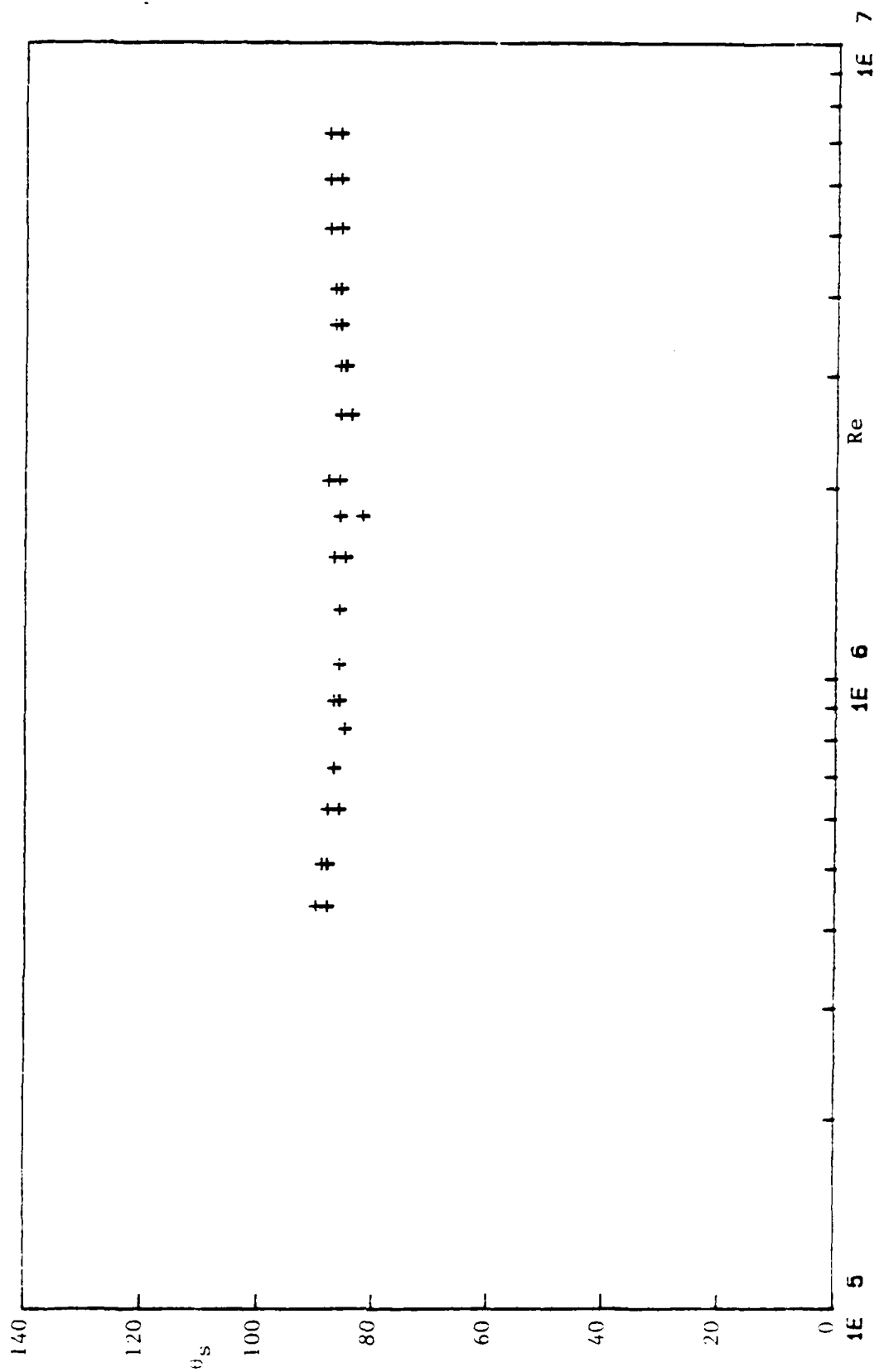
Figure 4.9.c   Rough Cylinder, K/D = 0.0012
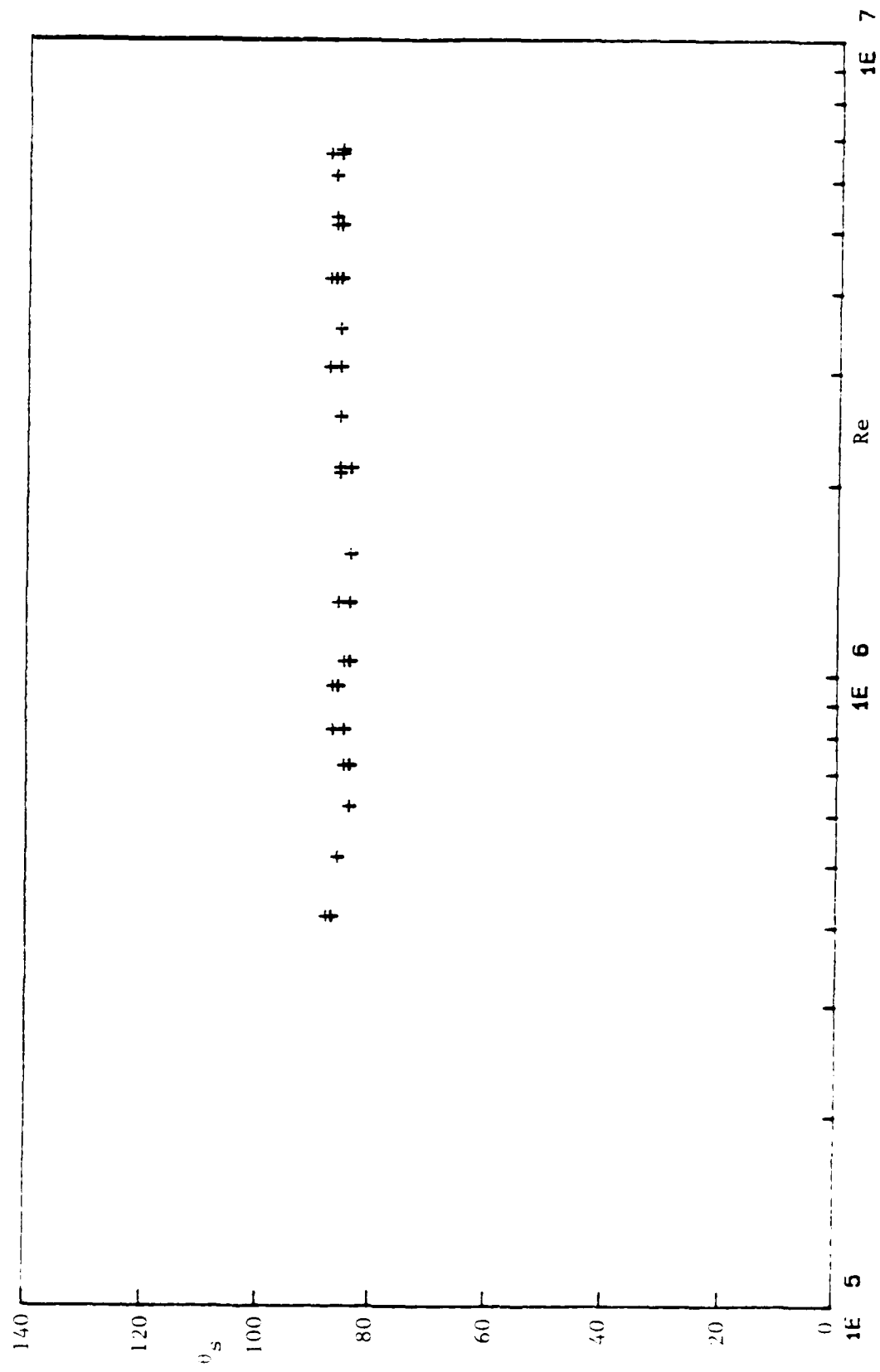
Figure 4.9.d   Rough Cylinder, K/D = 0.01

65

[SMOOTH CYLINDER]

Re= 0.309 x10⁶   K/D= 0.0000   RUN ID= 34
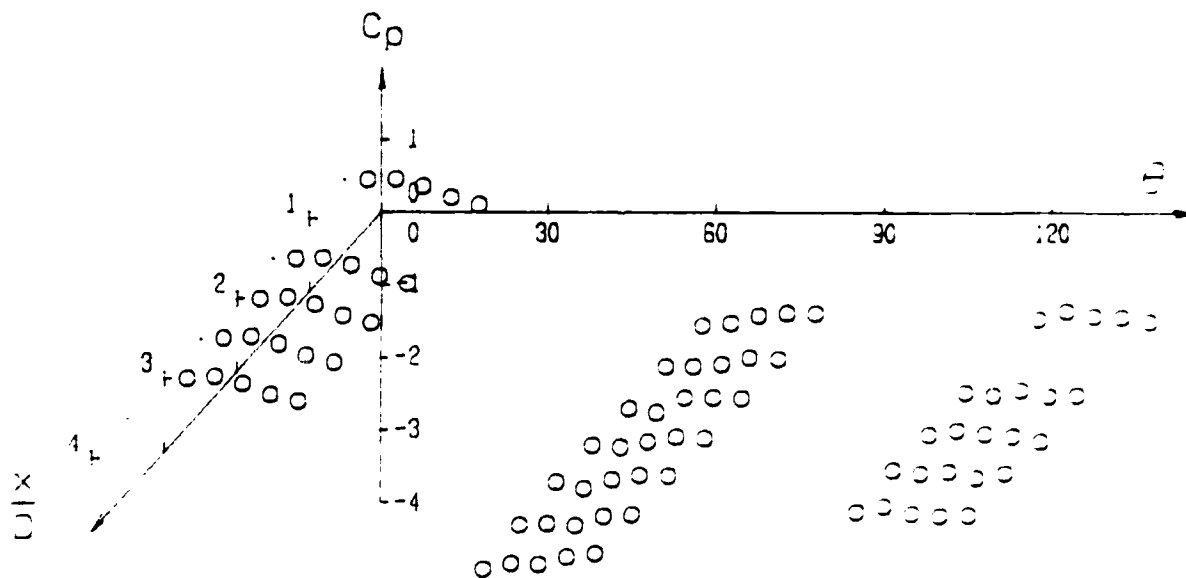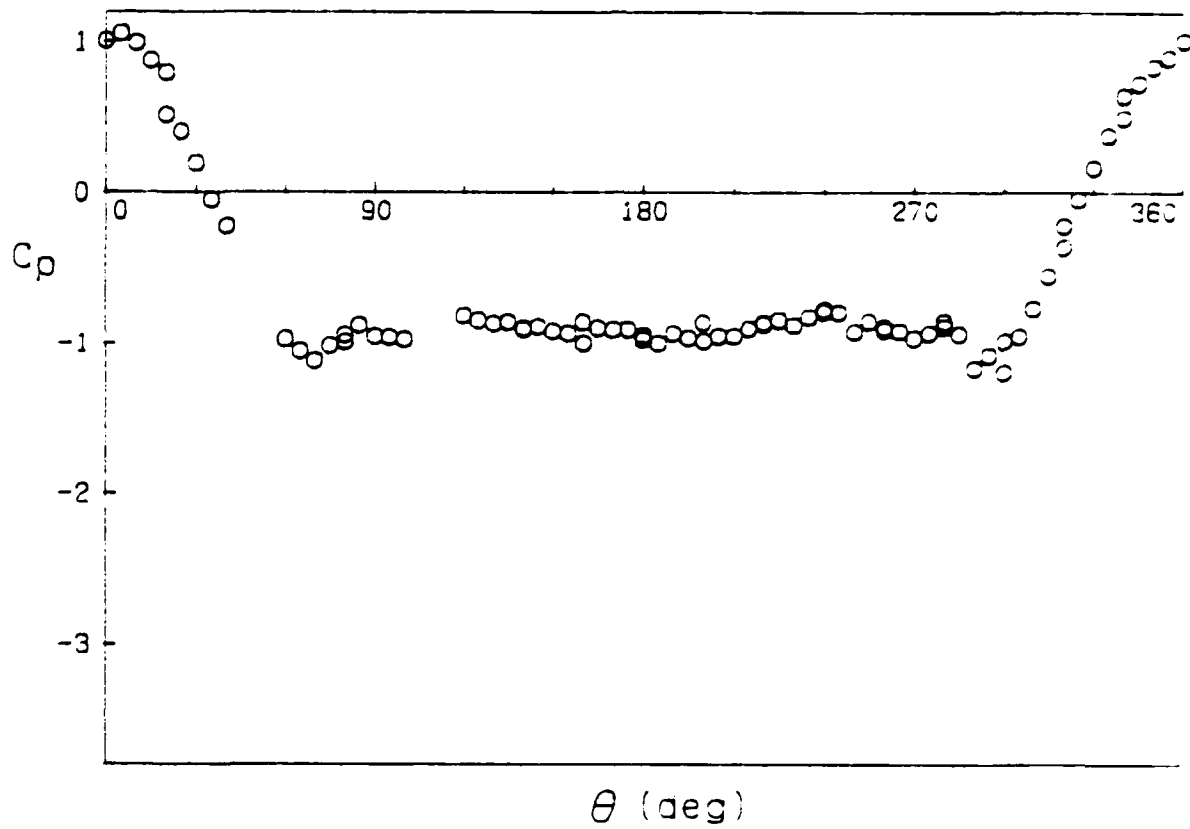
SMOOTH CYLINDER

Re= 0.328 x10⁶   K/D= 0.0000   RUN ID= 35
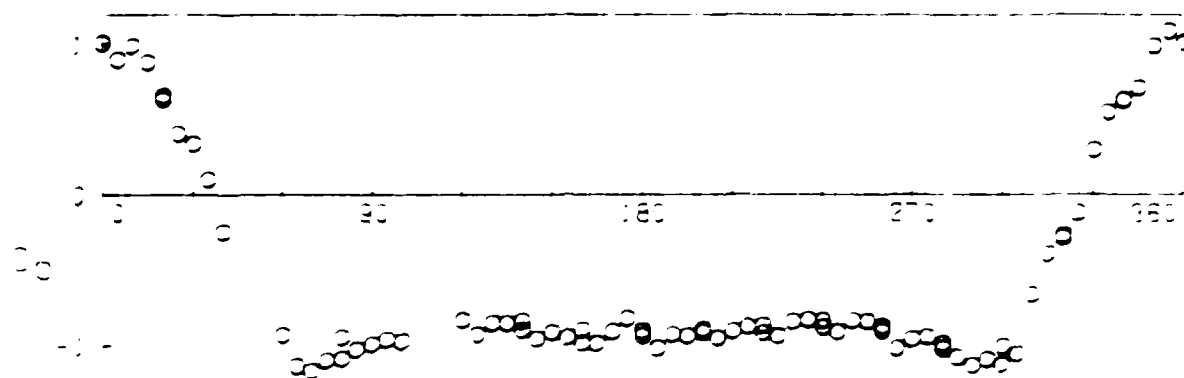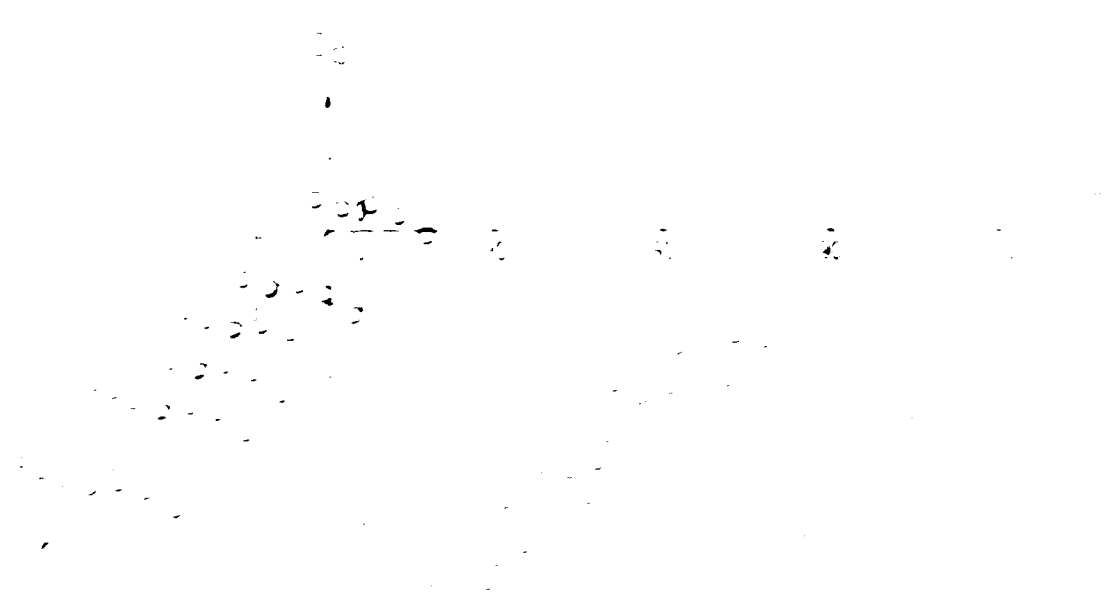
[SMOOTH CYLINDER]

Re= 0.331 x10⁶   K/D= 0.0000   RUN ID= 82
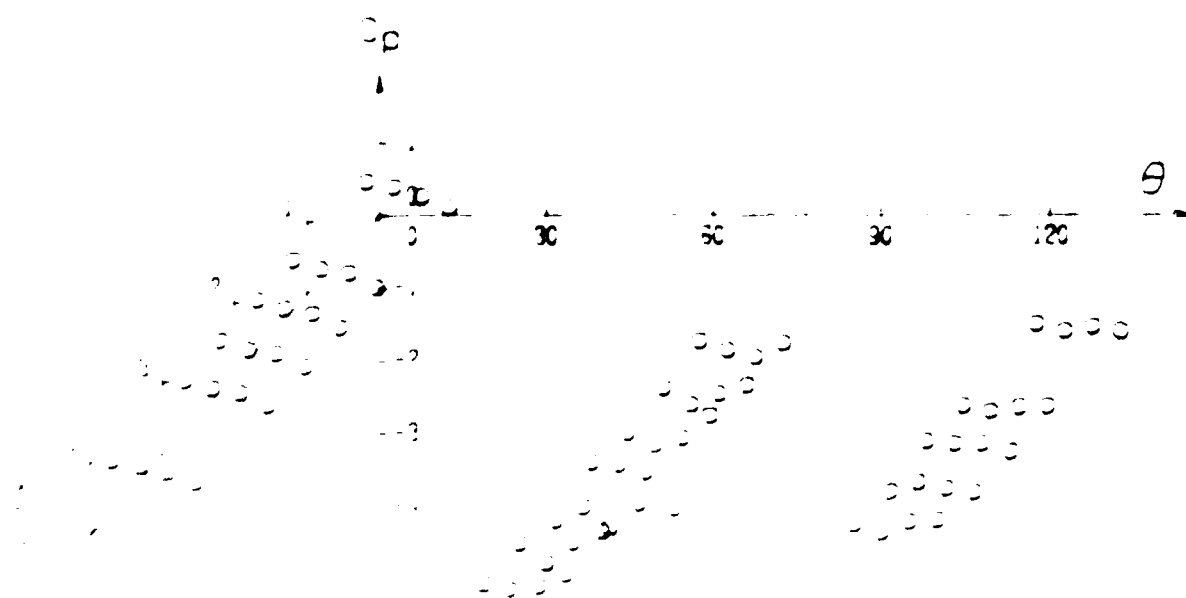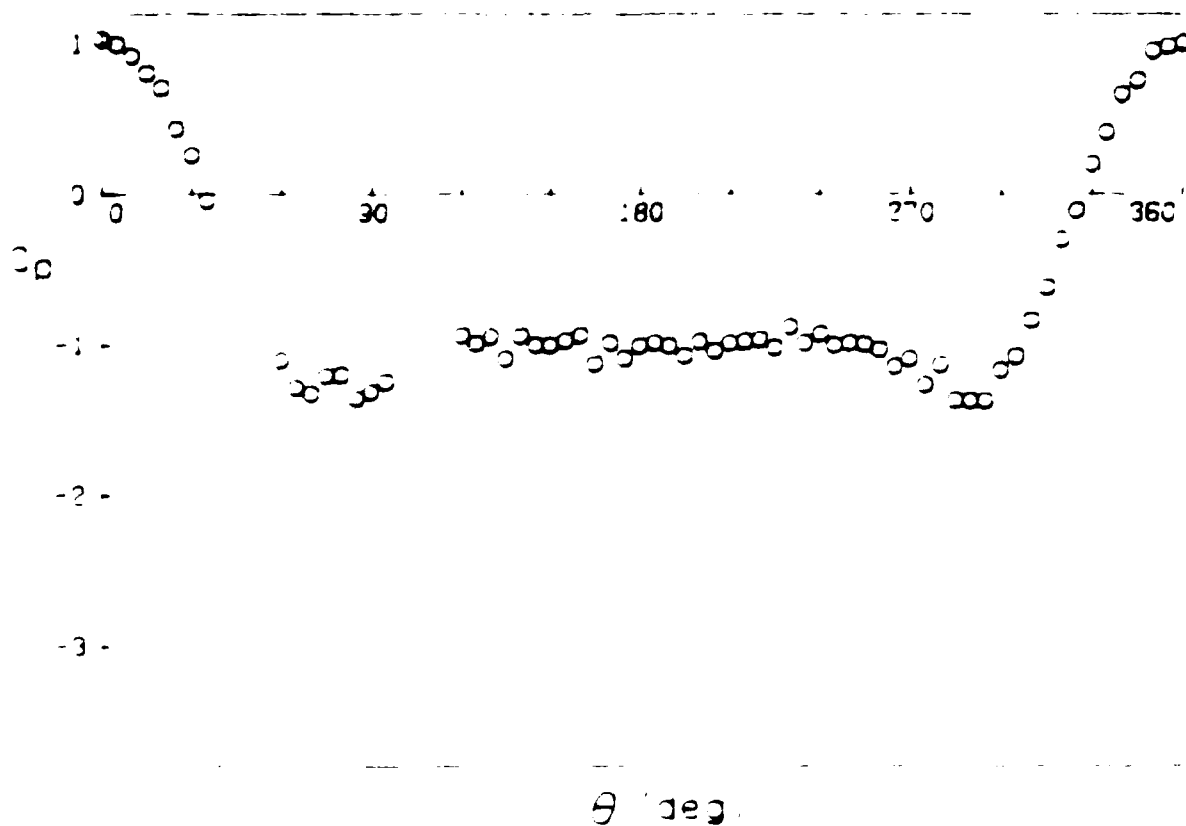
[SMOOTH CYLINDER]

Re= 0.354 ×10⁶   K/D= 0.0000   RUN ID= 36
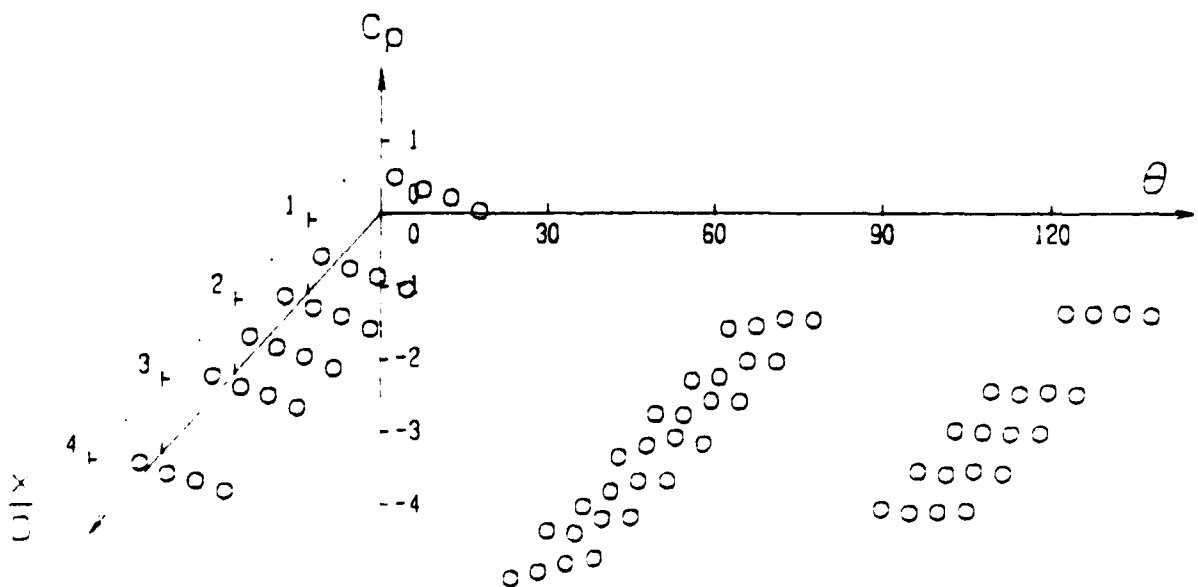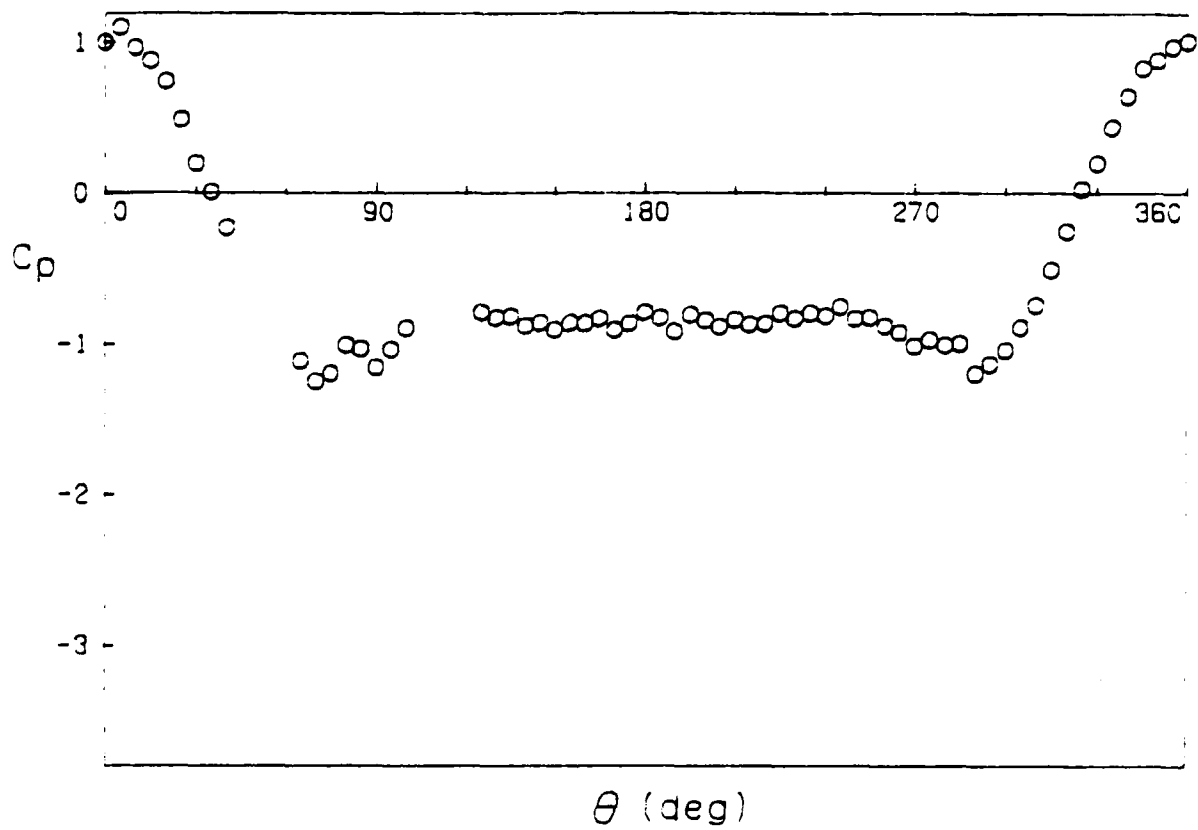
[SMOOTH CYLINDER]

Re= 0.364 ×10⁶   K/D= 0.0000   RUN ID= 78

θ (deg)
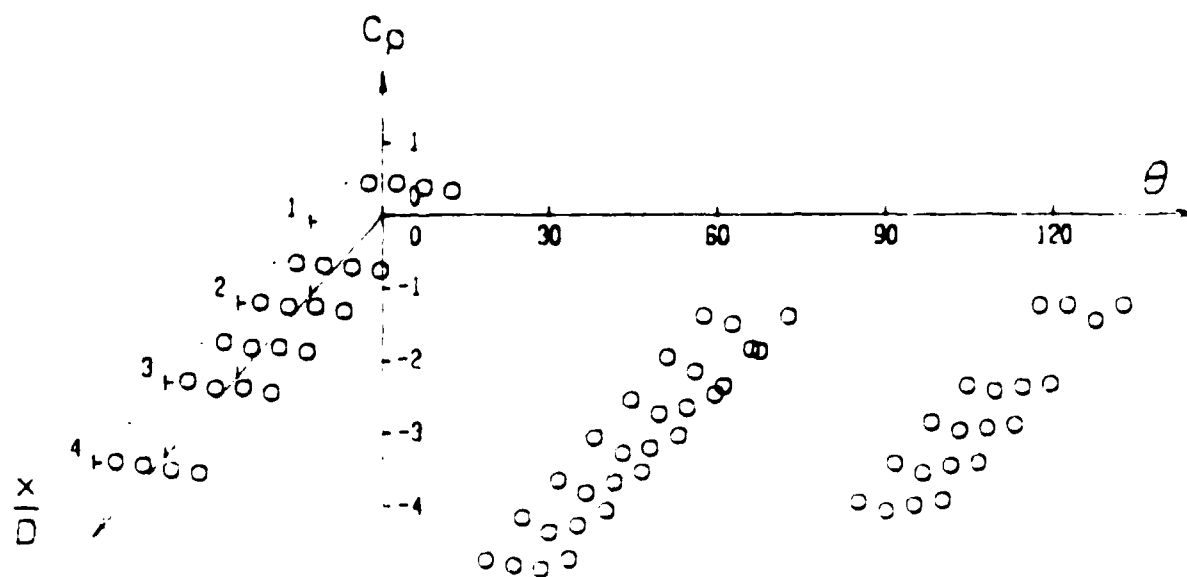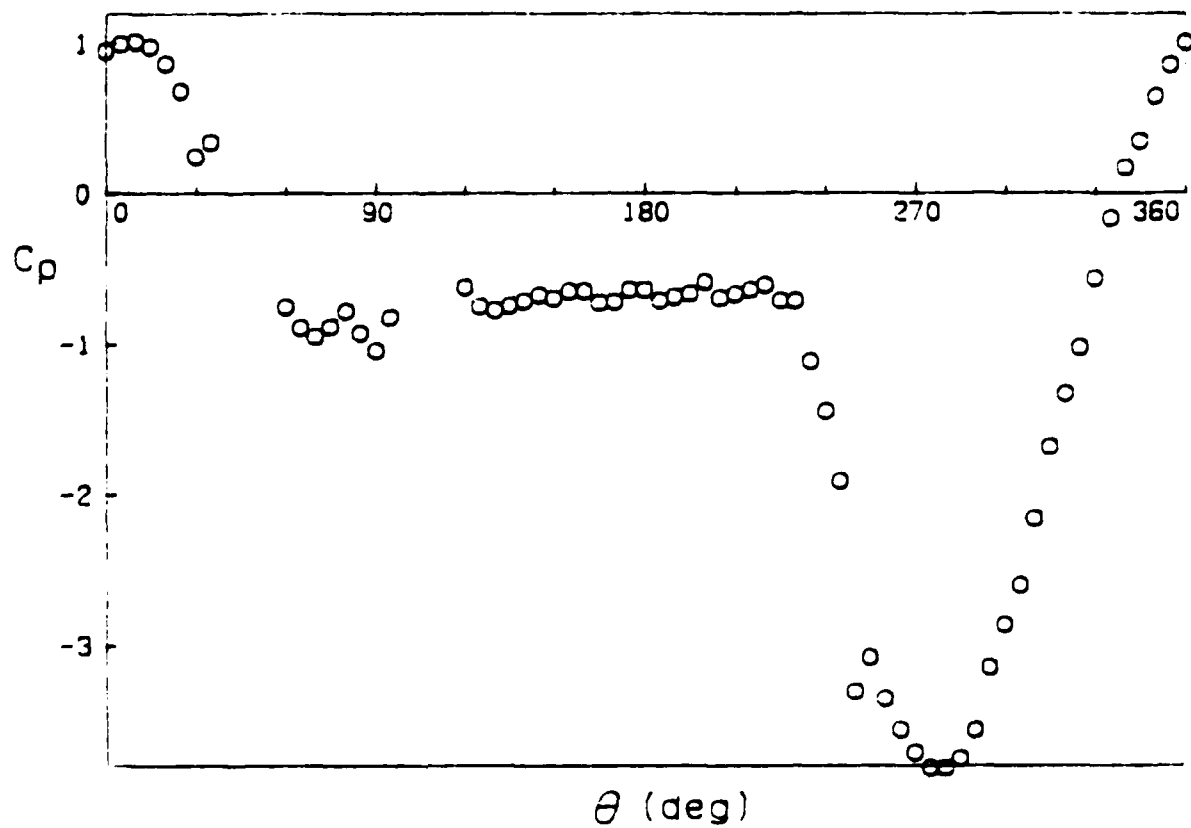
[SMOOTH CYLINDER]

Re= 0.371 ×10^6 K/D= 0.0000   RUN ID= 63

θ (deg)

[SMOOTH CYLINDER]

Re= 0.372 ×10⁶   k/D= 0.0000   RUN ID= 61
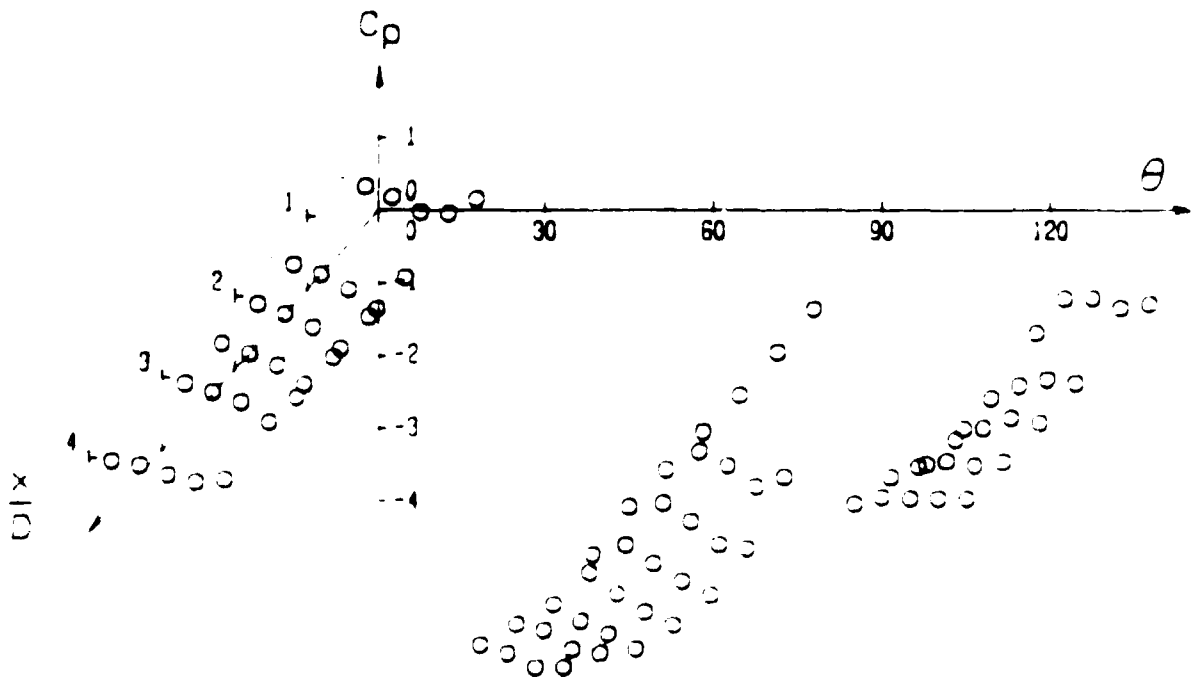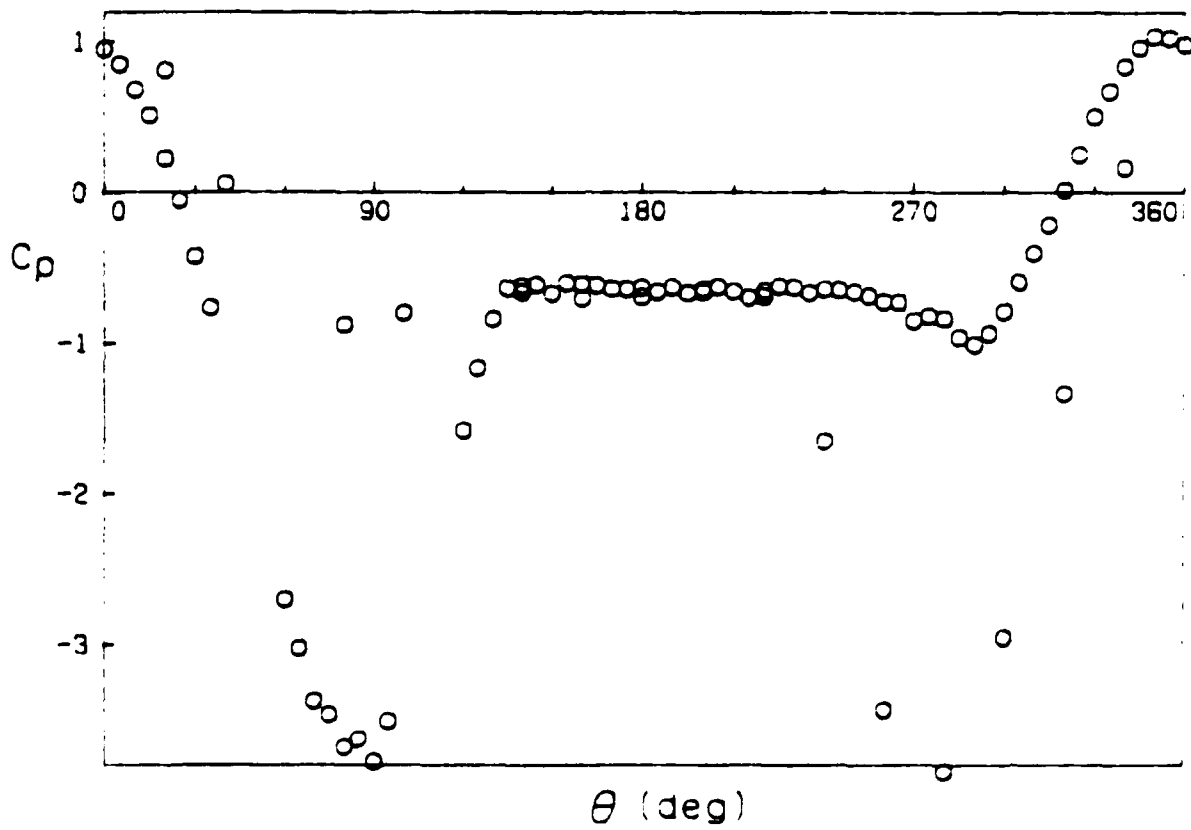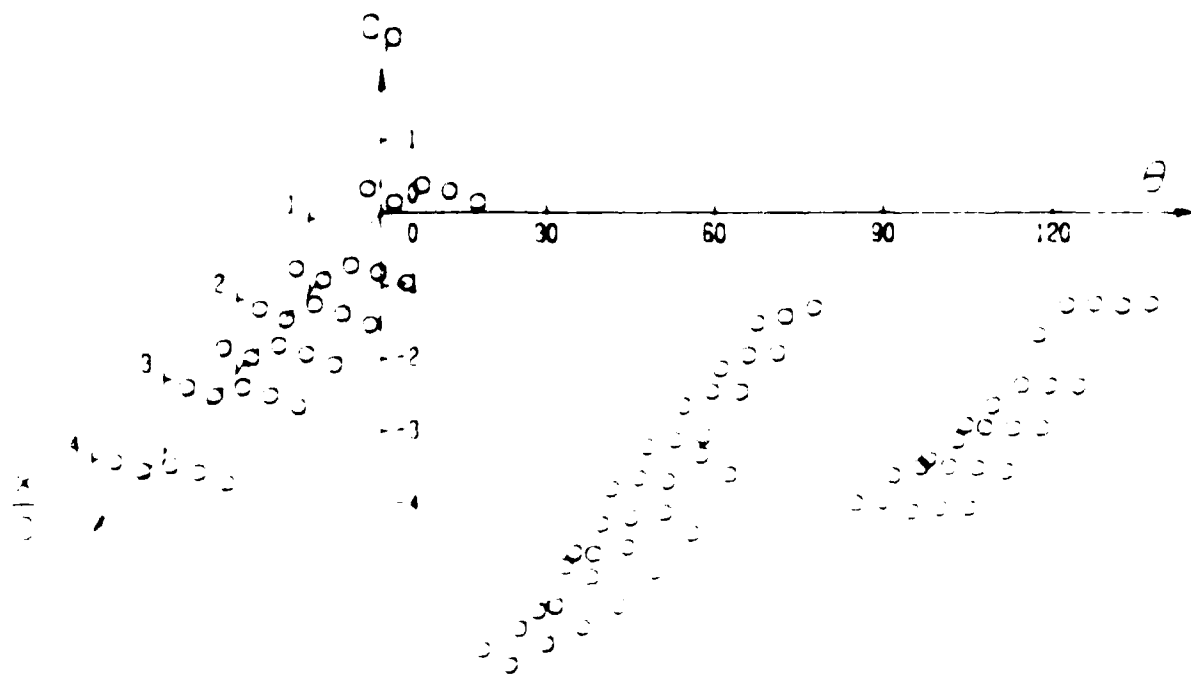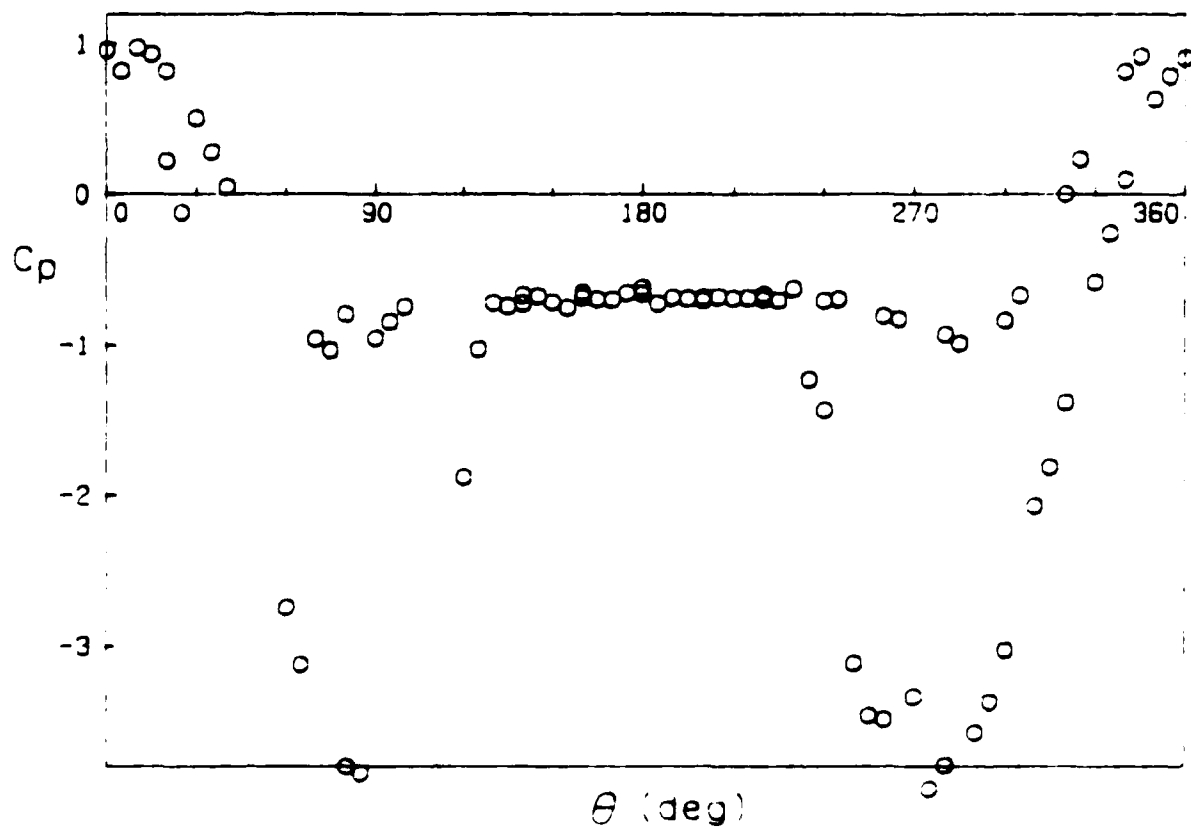
[SMOOTH CYLINDER]

Re= 0.372 x10⁶   K/D= 0.0000   RUN ID= 76
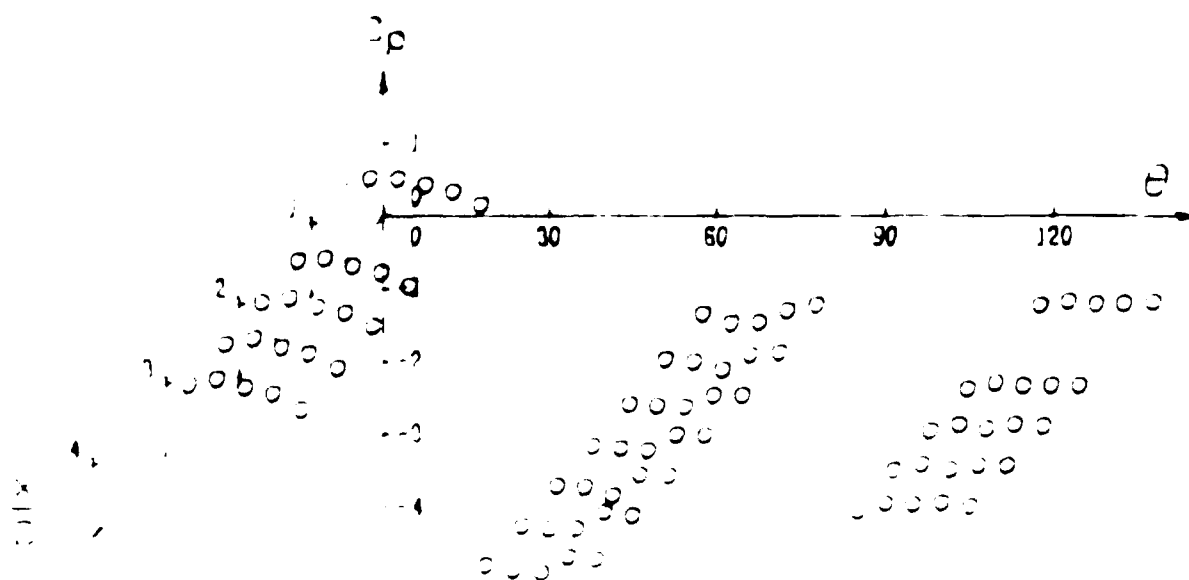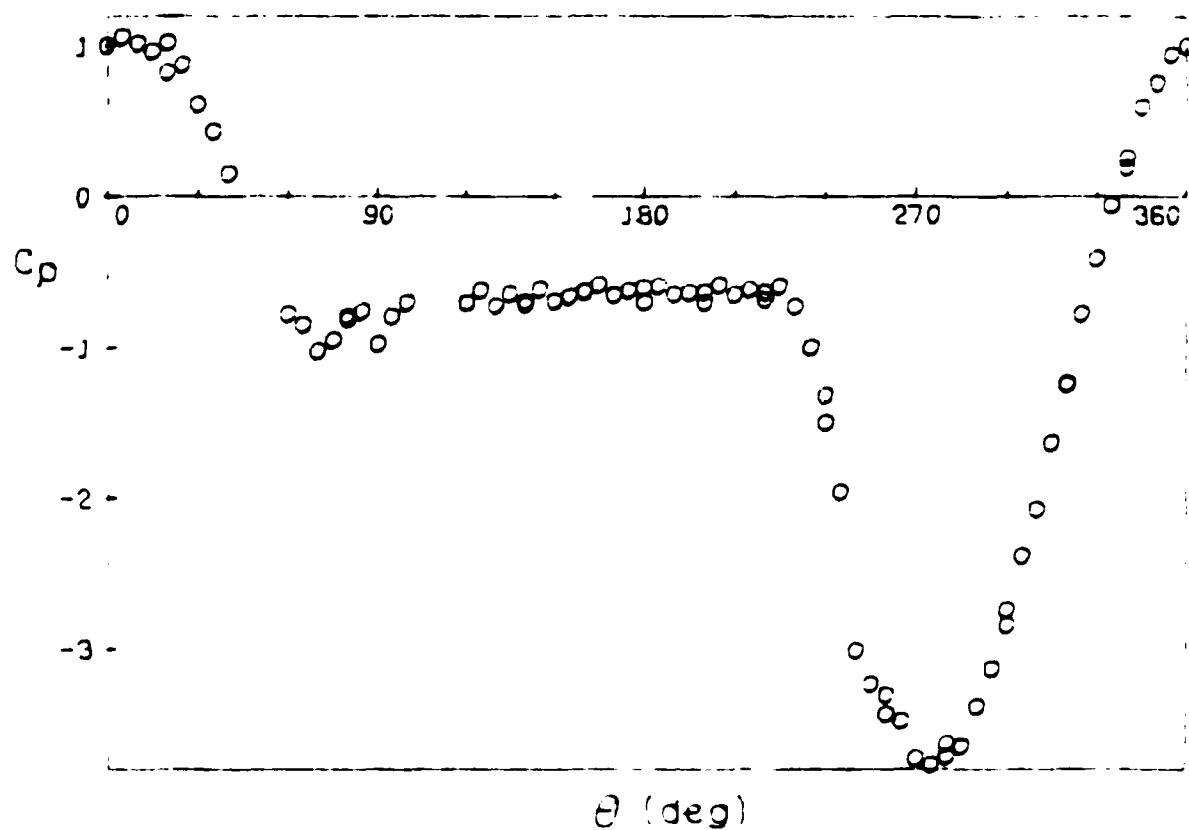
[SMOOTH CYLINDER]

Re= 0.375 x10⁶   k/D= 0.0000   RUN ID= 75

θ (deg)
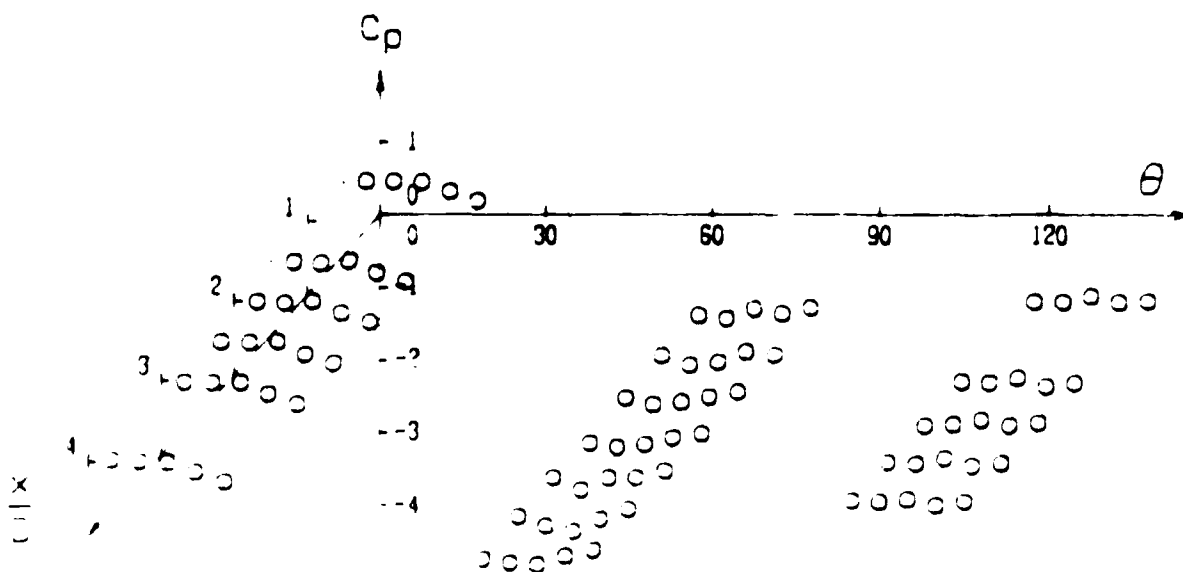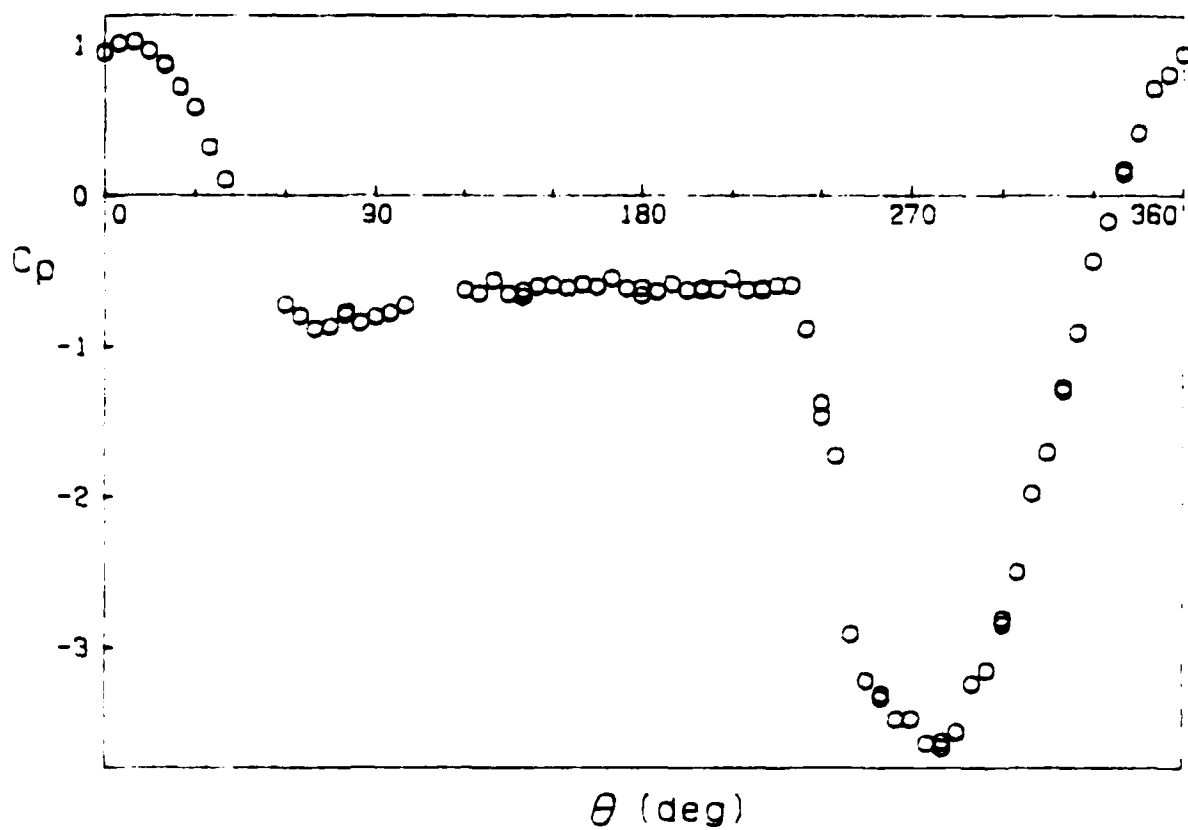
[SMOOTH CYLINDER]

Re= 0.376 x10^6 K/D= 0.0000   RUN ID= 37

θ (deg)
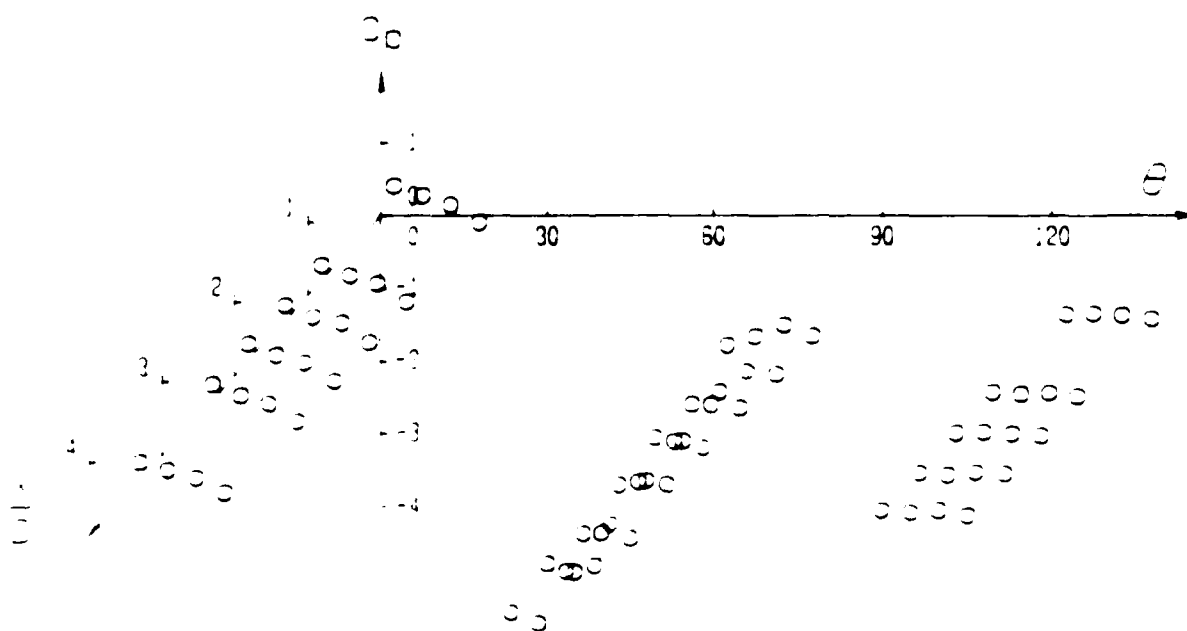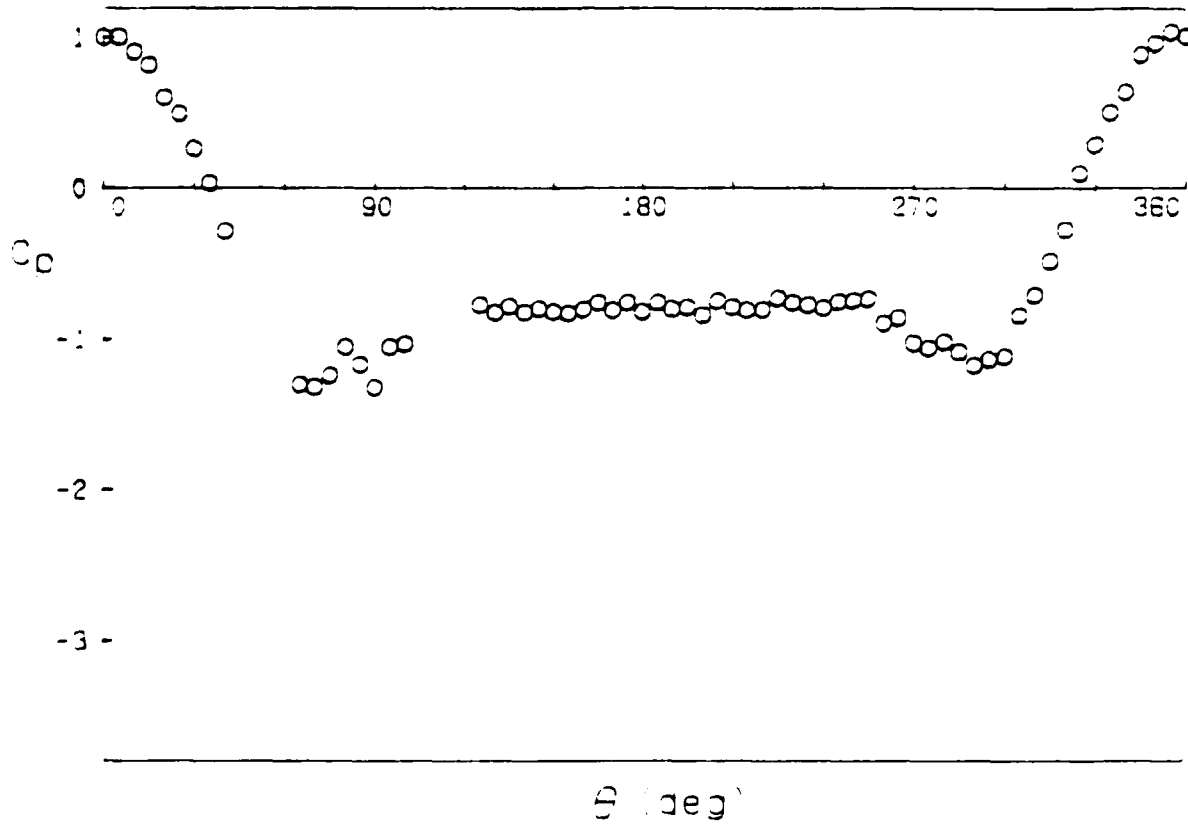
[SMOOTH CYLINDER]

Re= 0.382 ×10⁶   K/D= 0.0000   RUN ID= 60
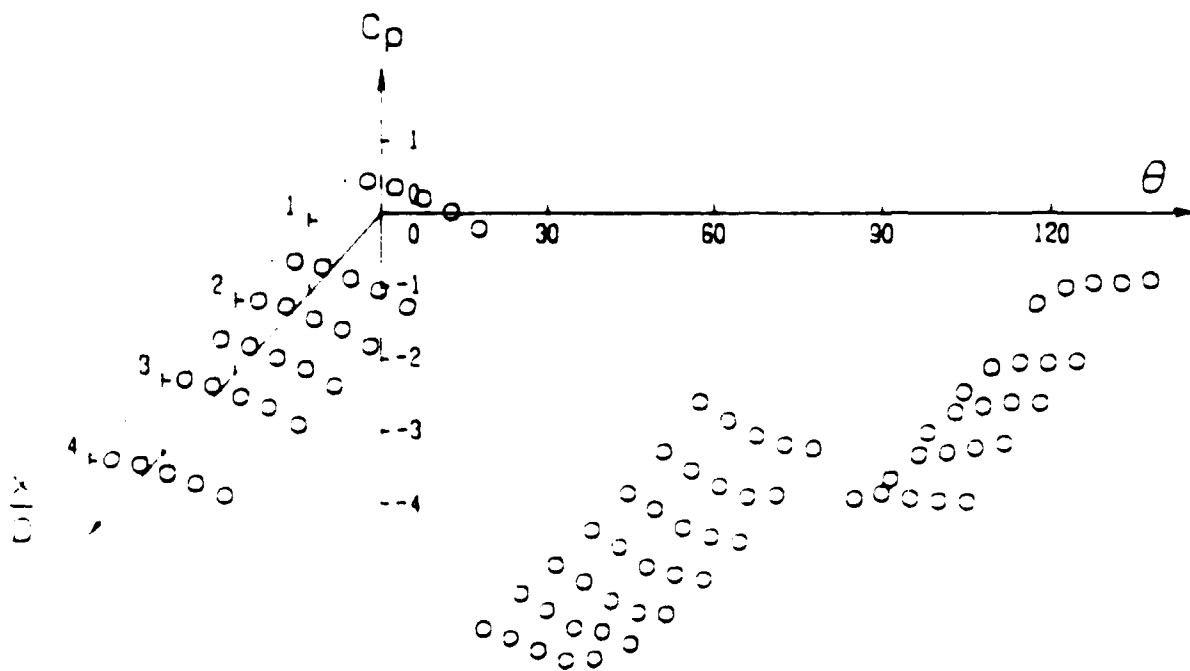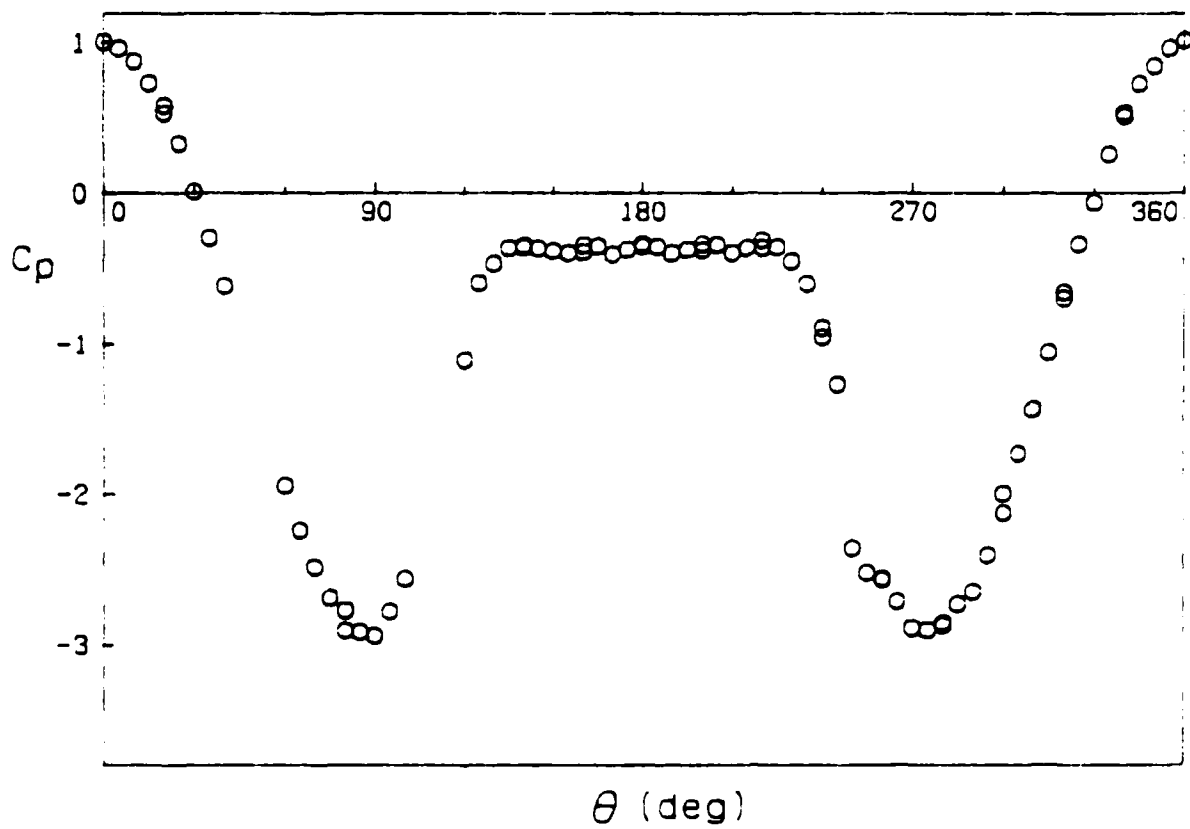
[SMOOTH CYLINDER]

Re= 0.383 ×10⁶   K/D= 0.0000   RUN ID= 64
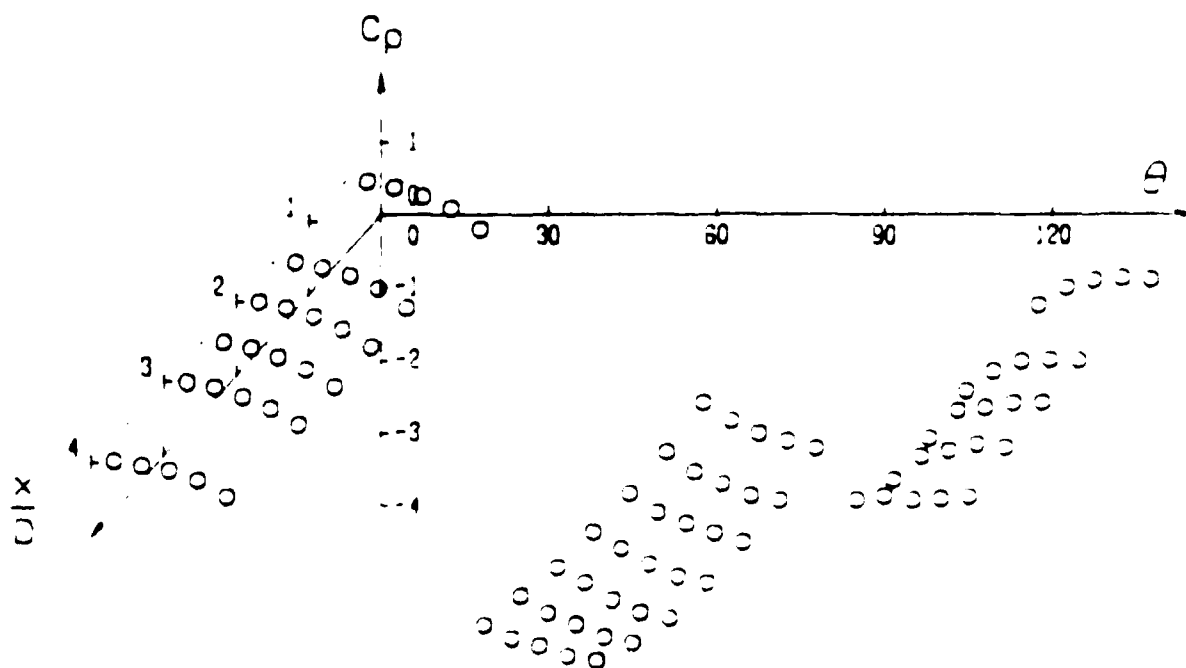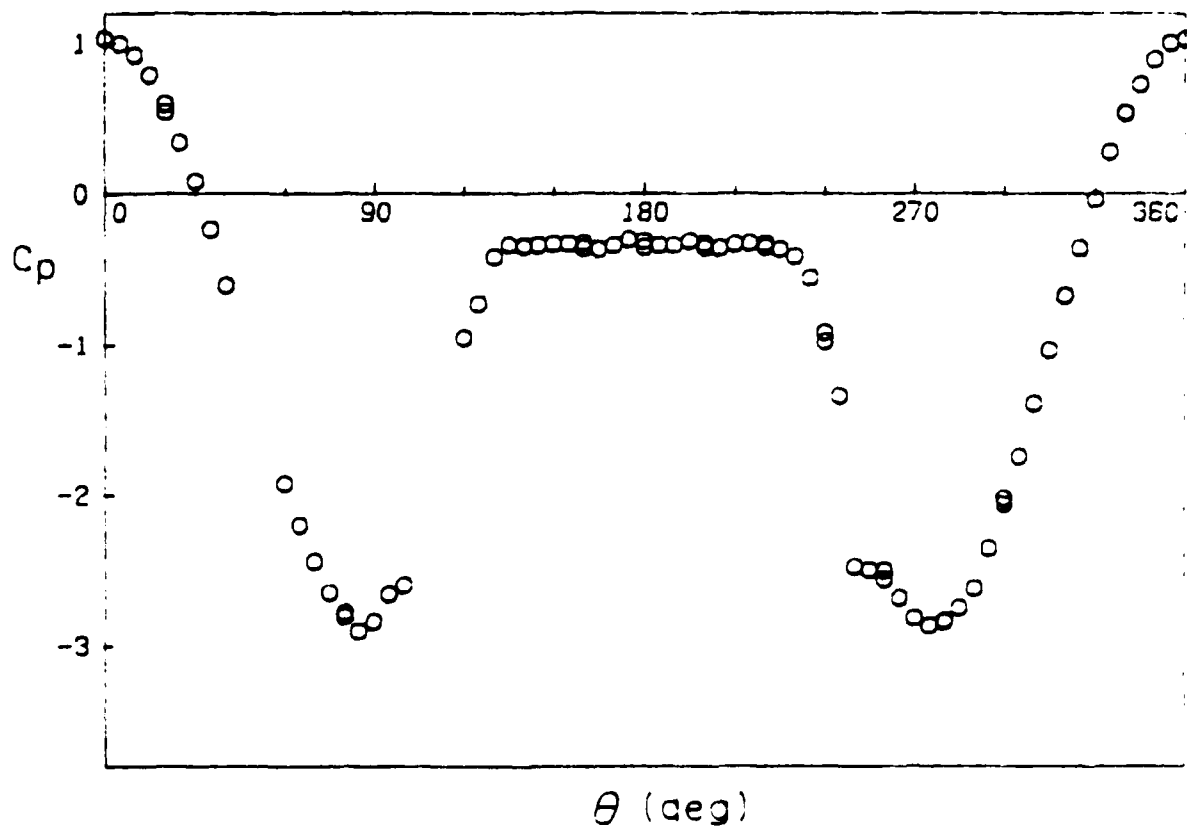
θ (deg)

[SMOOTH CYLINDER]

Re= 0.385 x10^6 K/D= 0.0000   RUN ID= 74
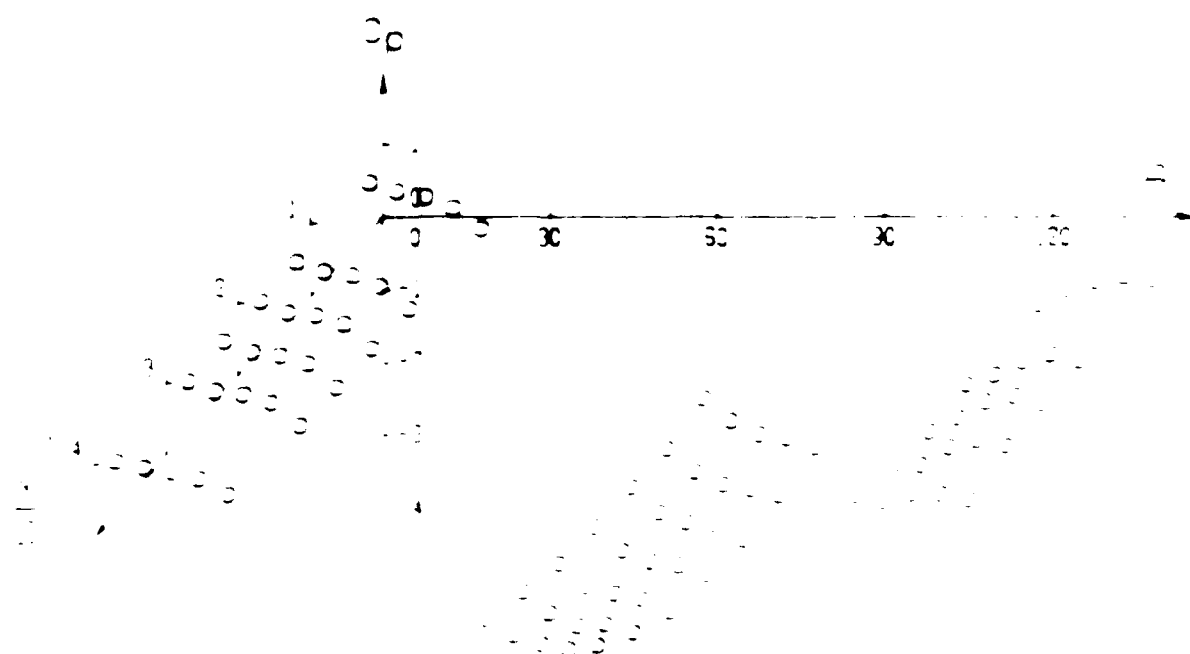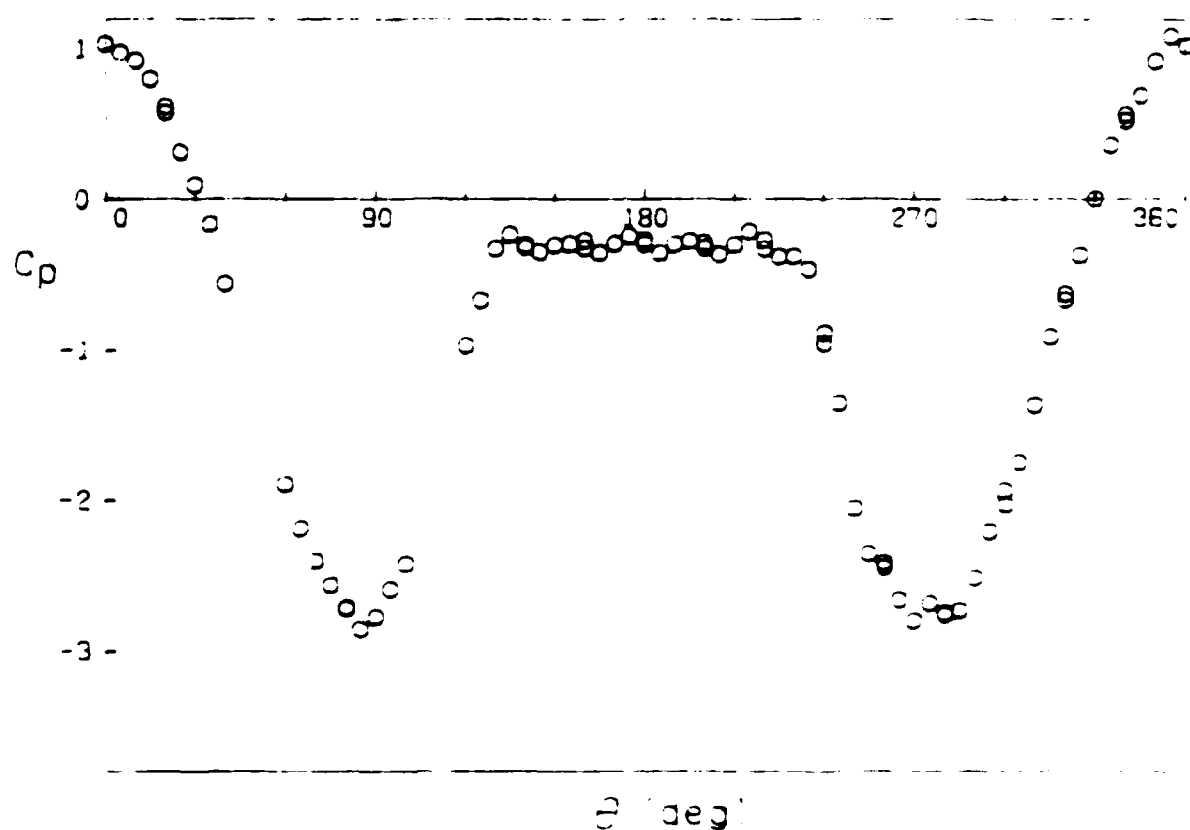
[SMOOTH CYLINDER]

Re= 0.393 ×10⁶   K/D= C.OOCO   RUN ID= 65
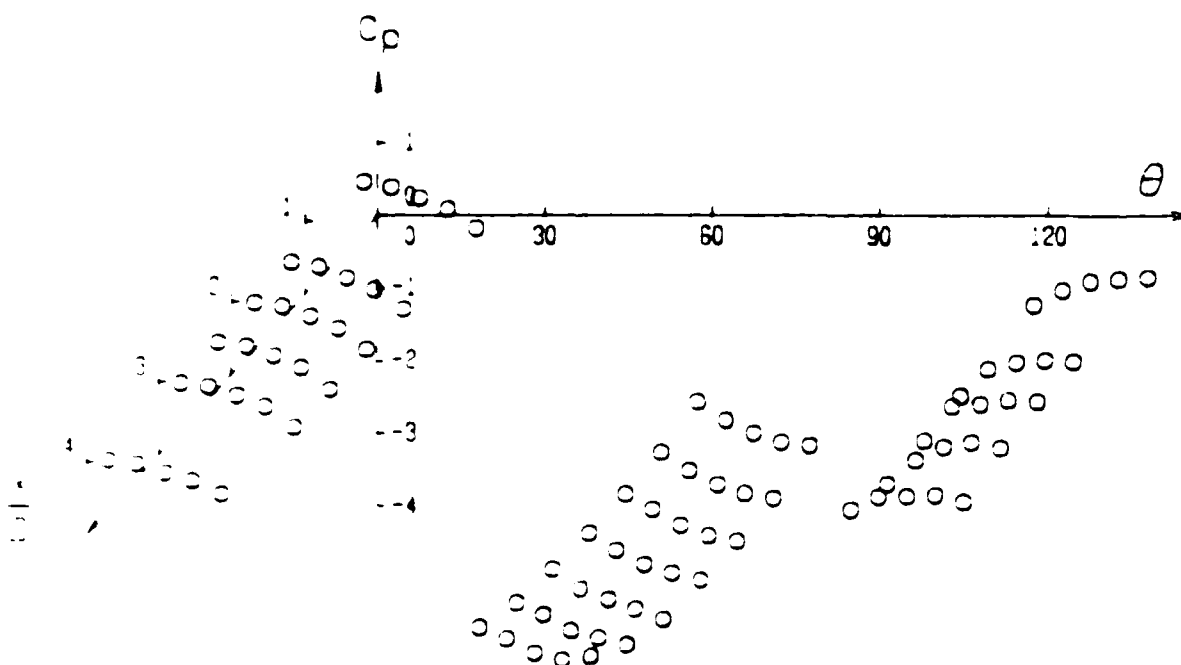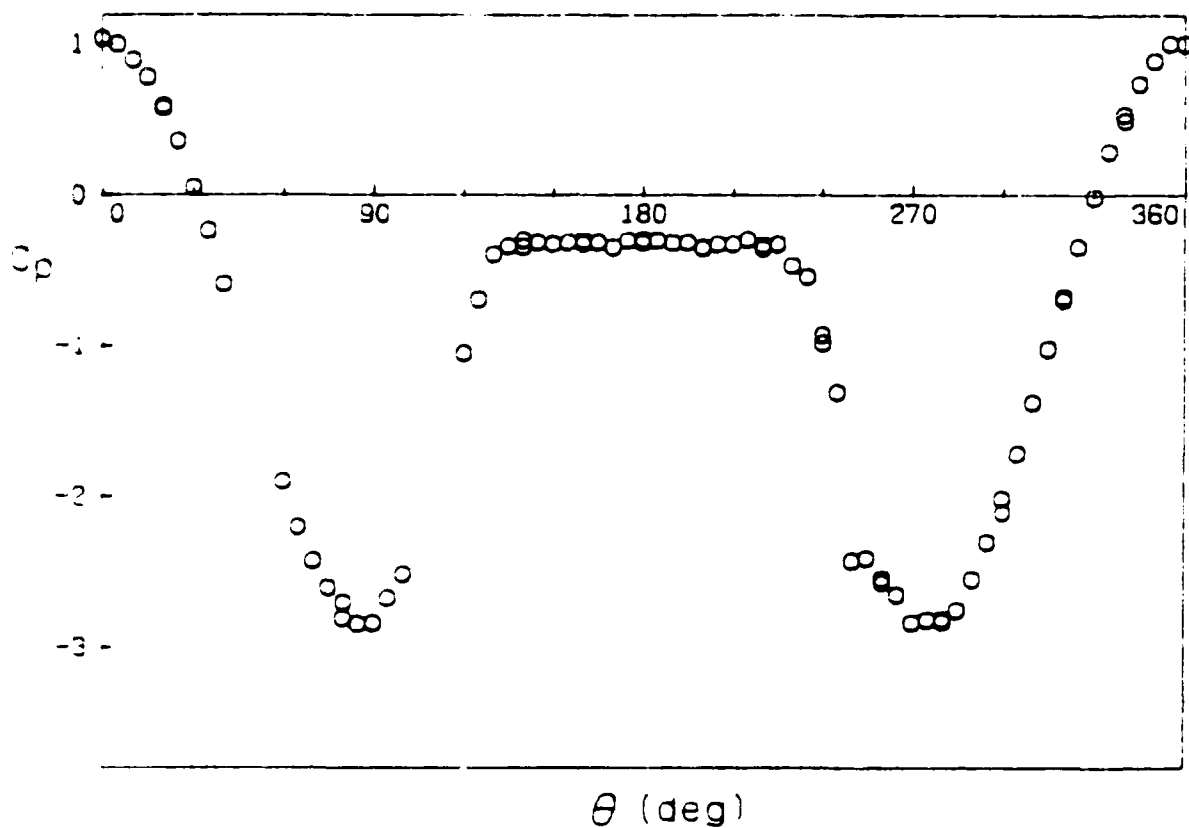
[SMOOTH CYLINDER]

Re= 0.395 x10⁶   K/D= 0.0000   RUN ID= 59
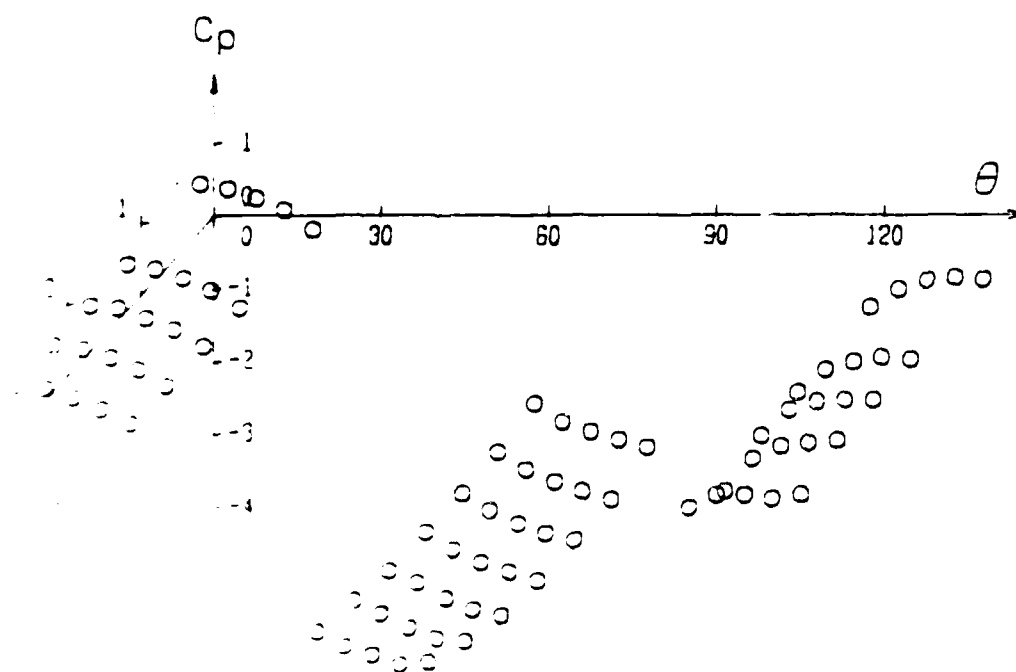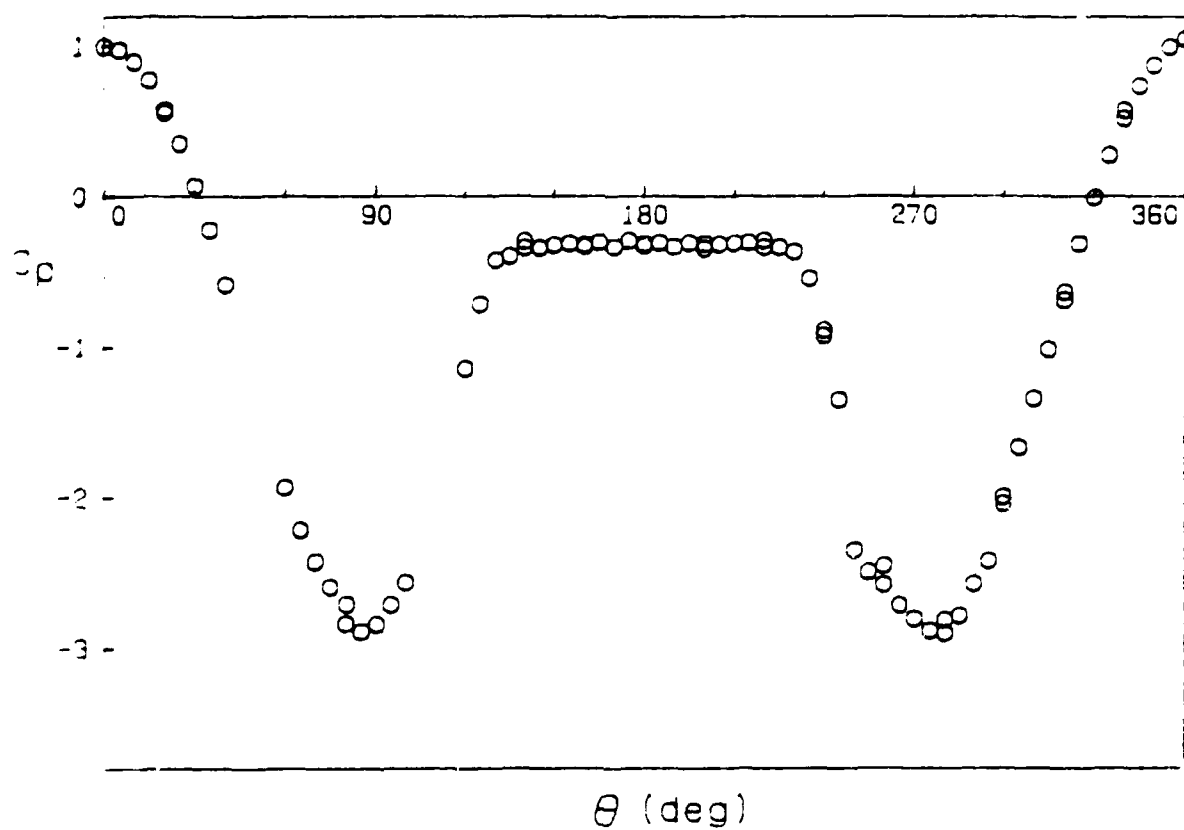
SMOOTH CYLINDER

Re= 0.395 x10^6   k/D= 0.000   RUN 27=

θ (deg)

I-16

SMOOTH CYLINDER

RE= ... 10^6 M= ...   R.N. ID= 33

90   180   270   360

-2

-3

θ deg

Cp

0   30   60   90   120   θ

x/D
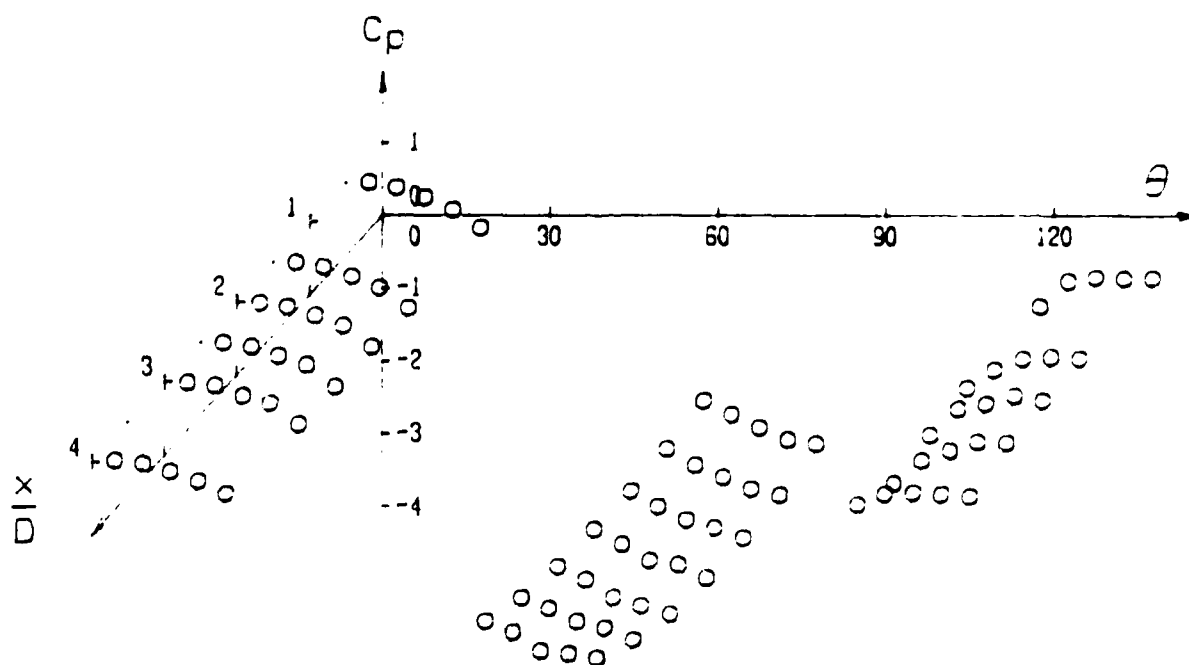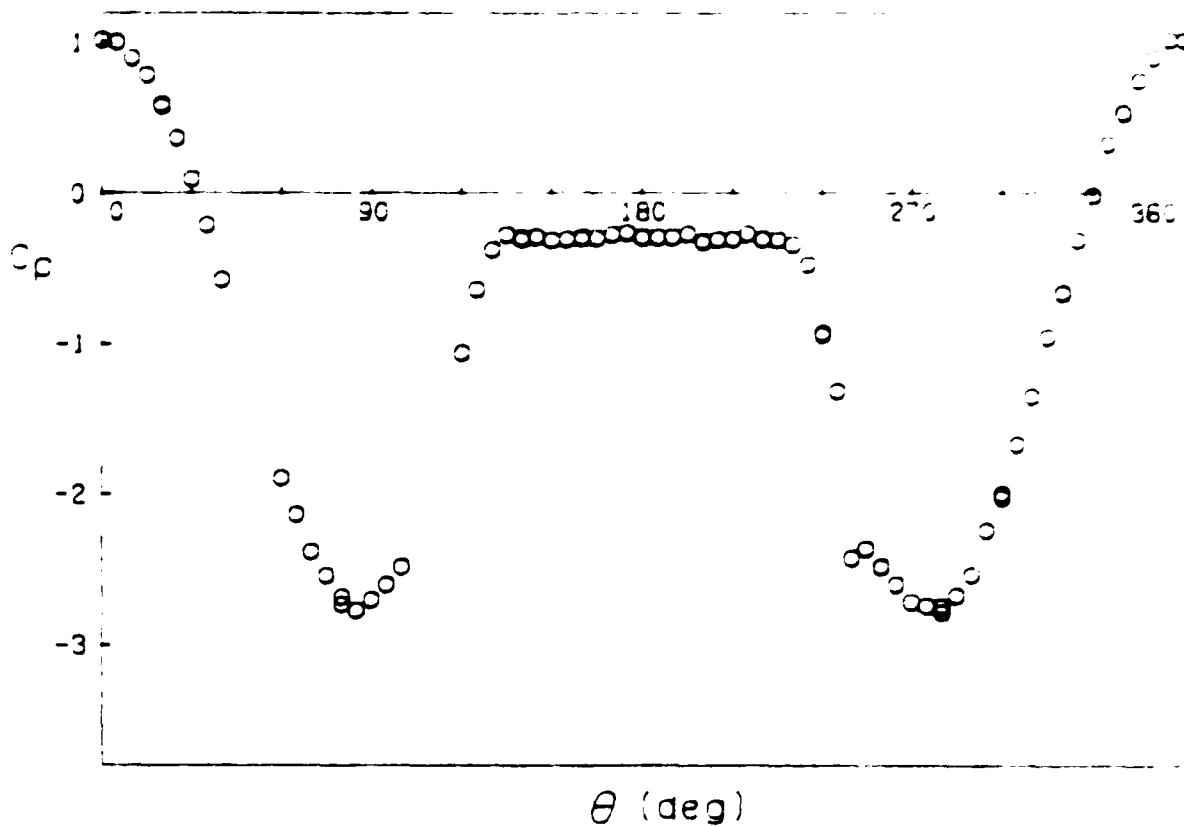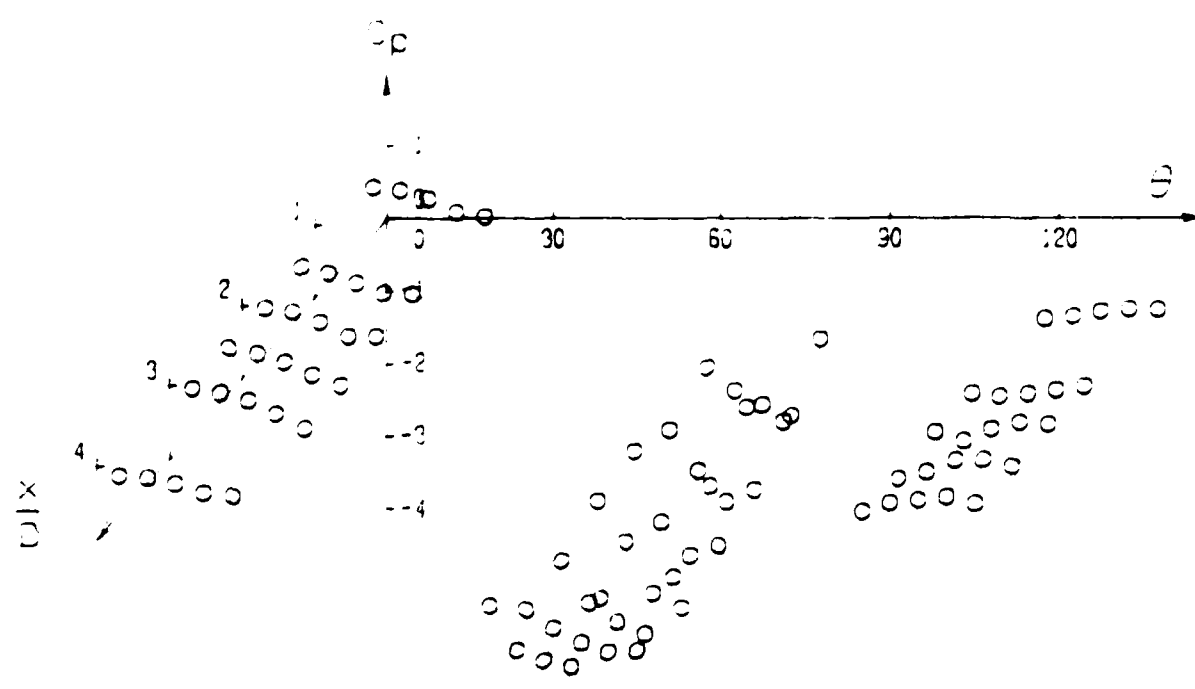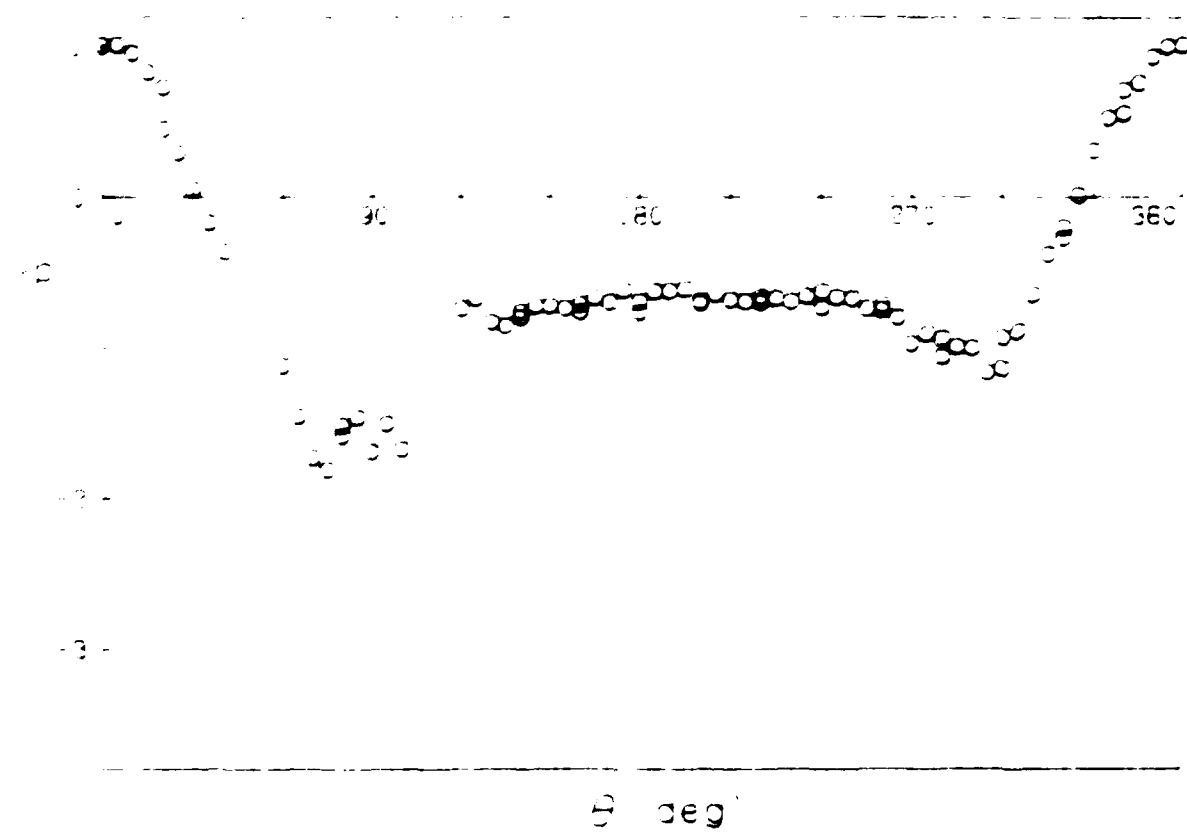
[SMOOTH CYLINDER]

Re= 0.403 ×10⁶   K/D= 0.0000   RUN ID= 66
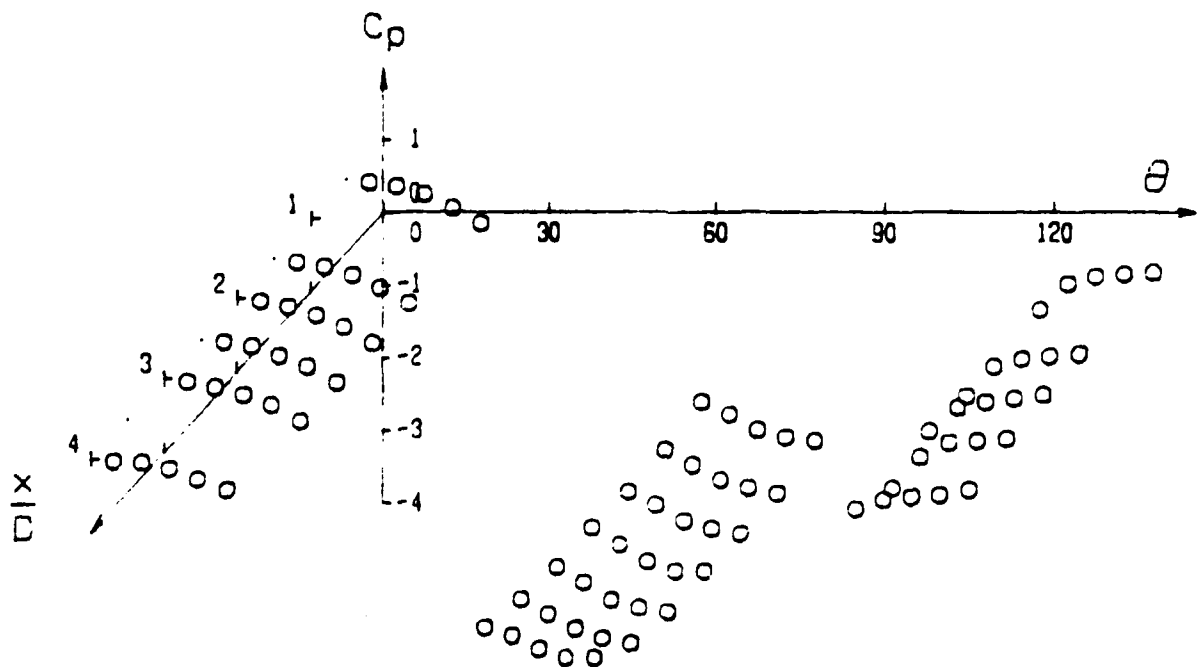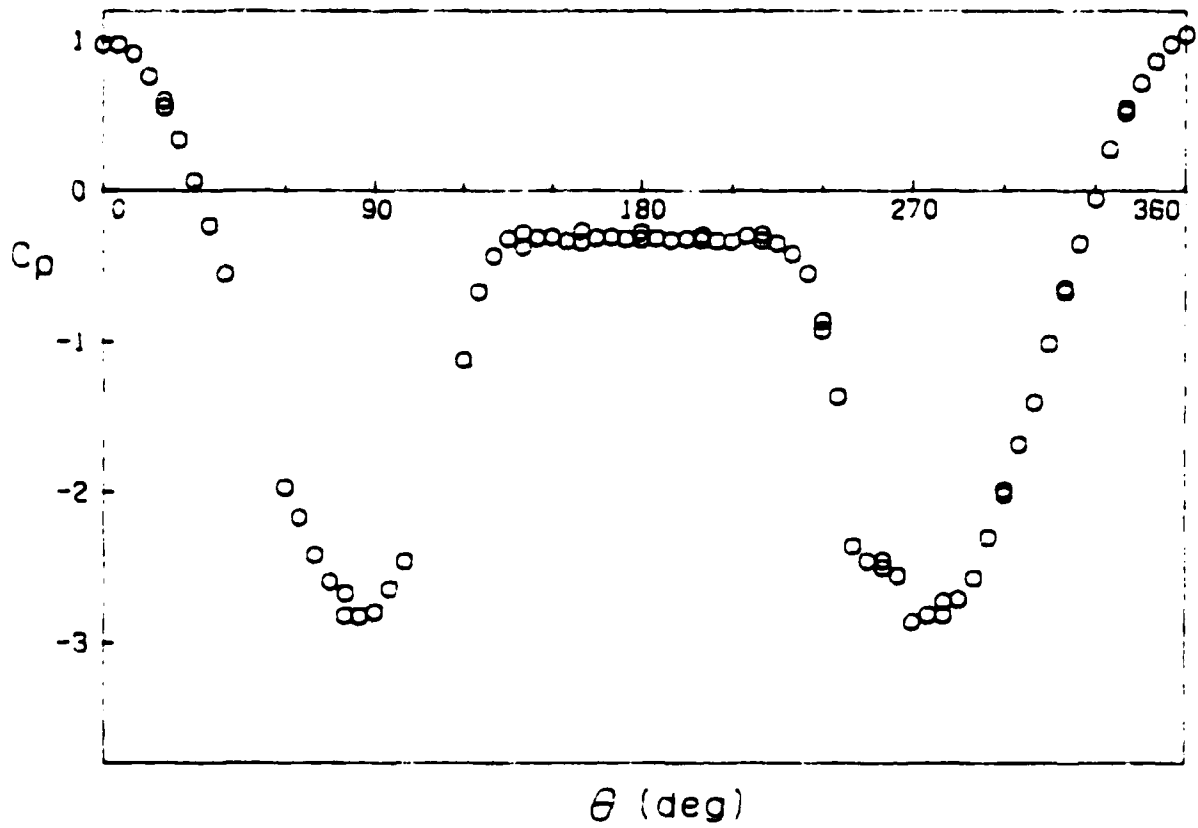
[SMOOTH CYLINDER]

Re= 0.404 x10⁶   k/D= 0.0000   RUN ID= 58

θ (deg)

I-19
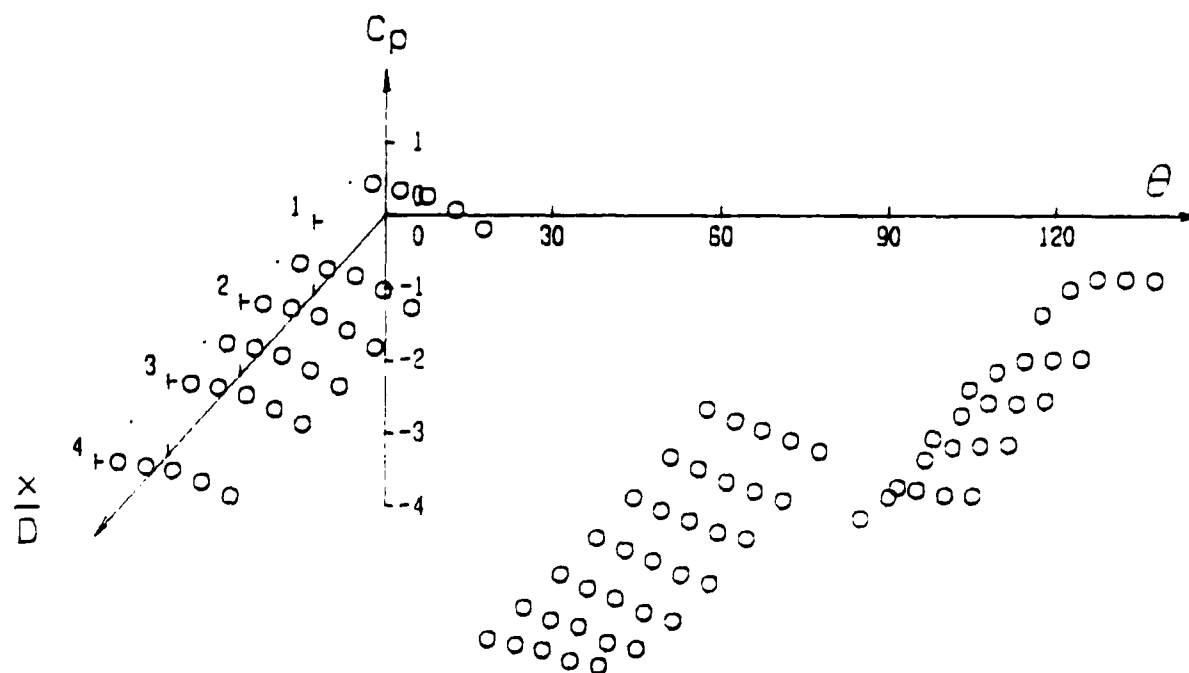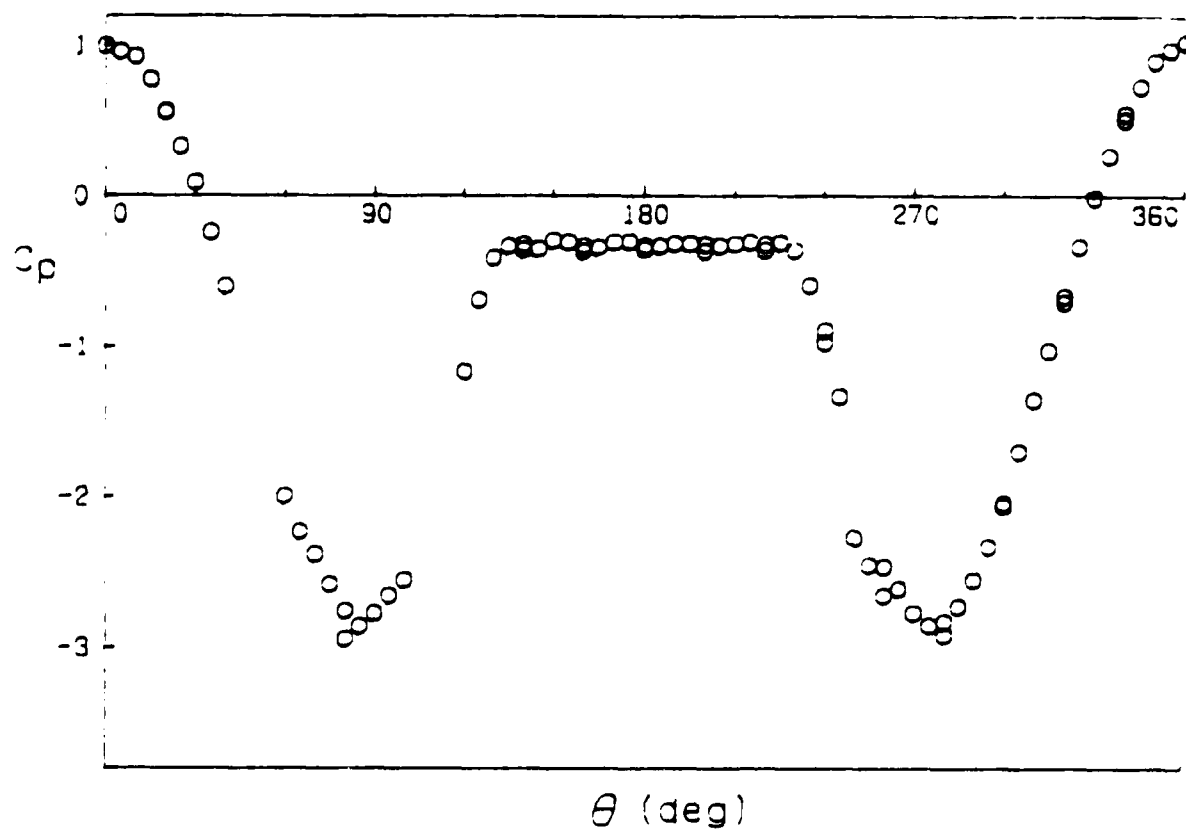
SMOOTH CYLINDER

Re= 0.406 × 10⁶   K/D= 0.0000   RUN ID= 67

I-20

θ (deg)

θ deg
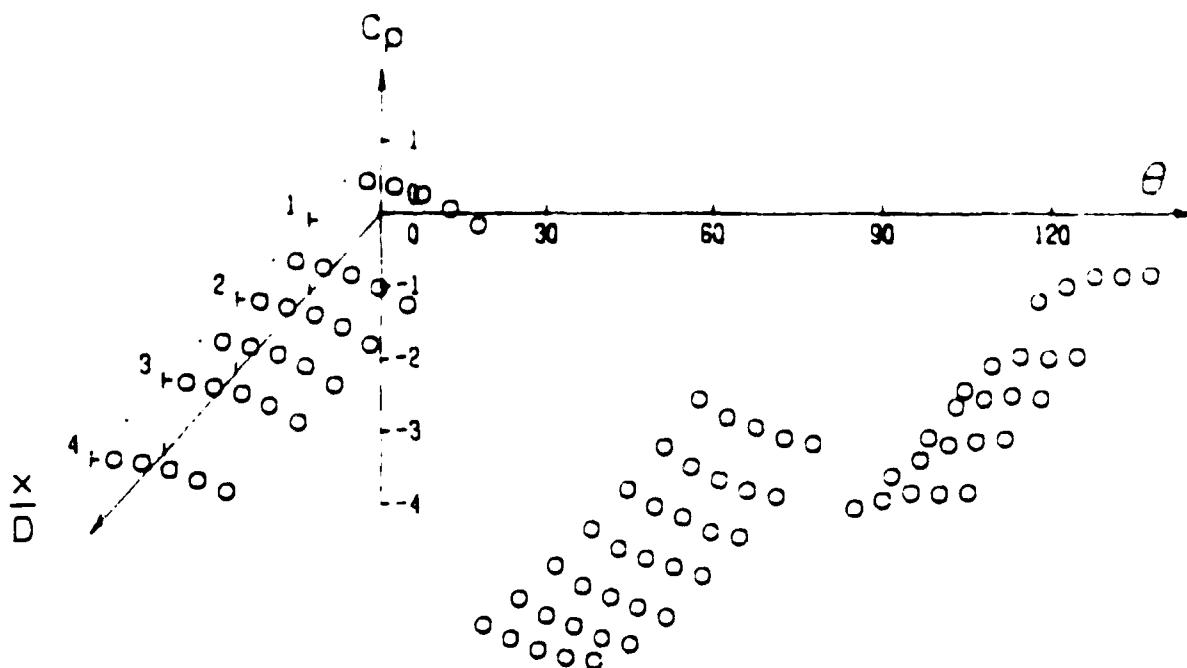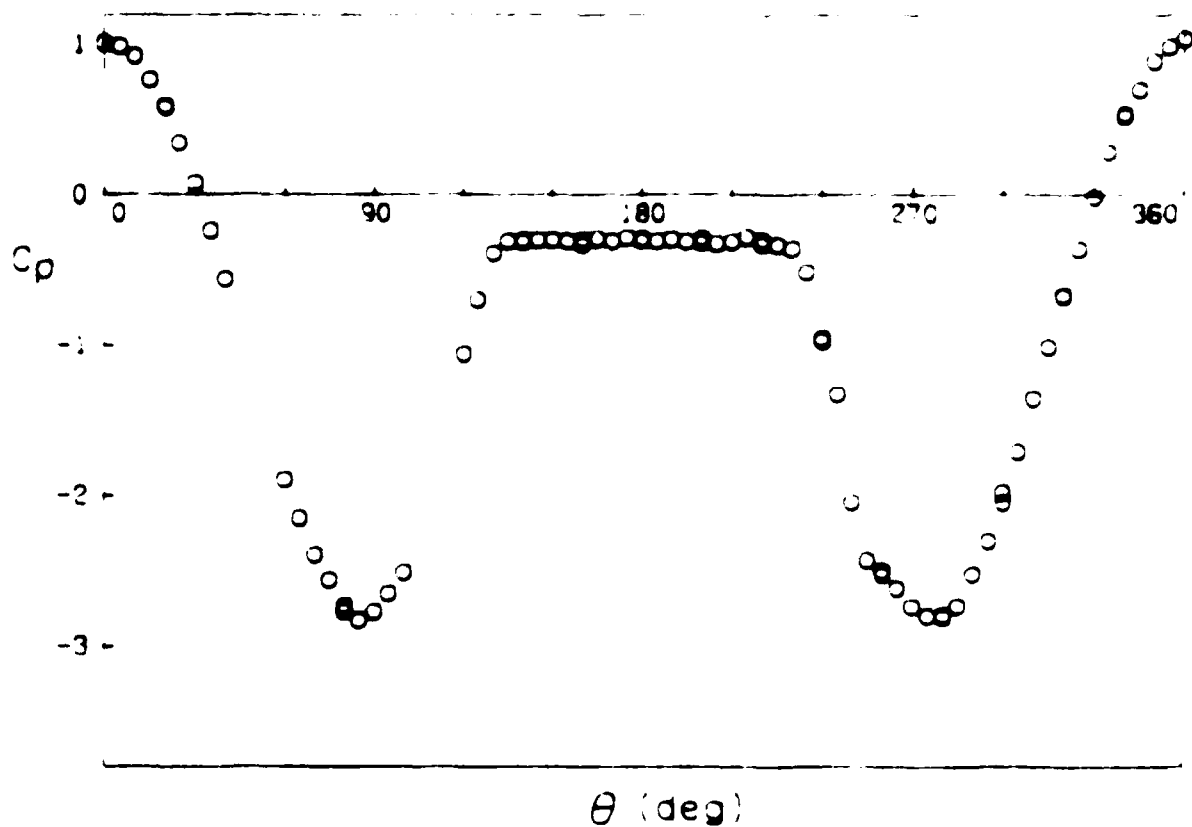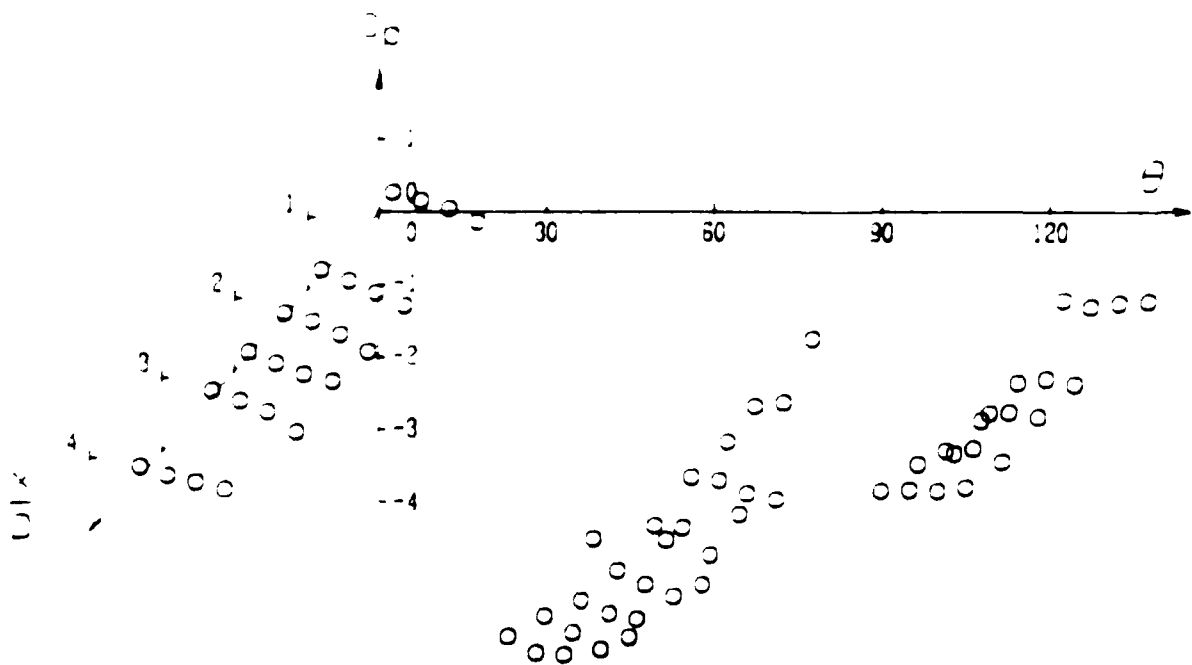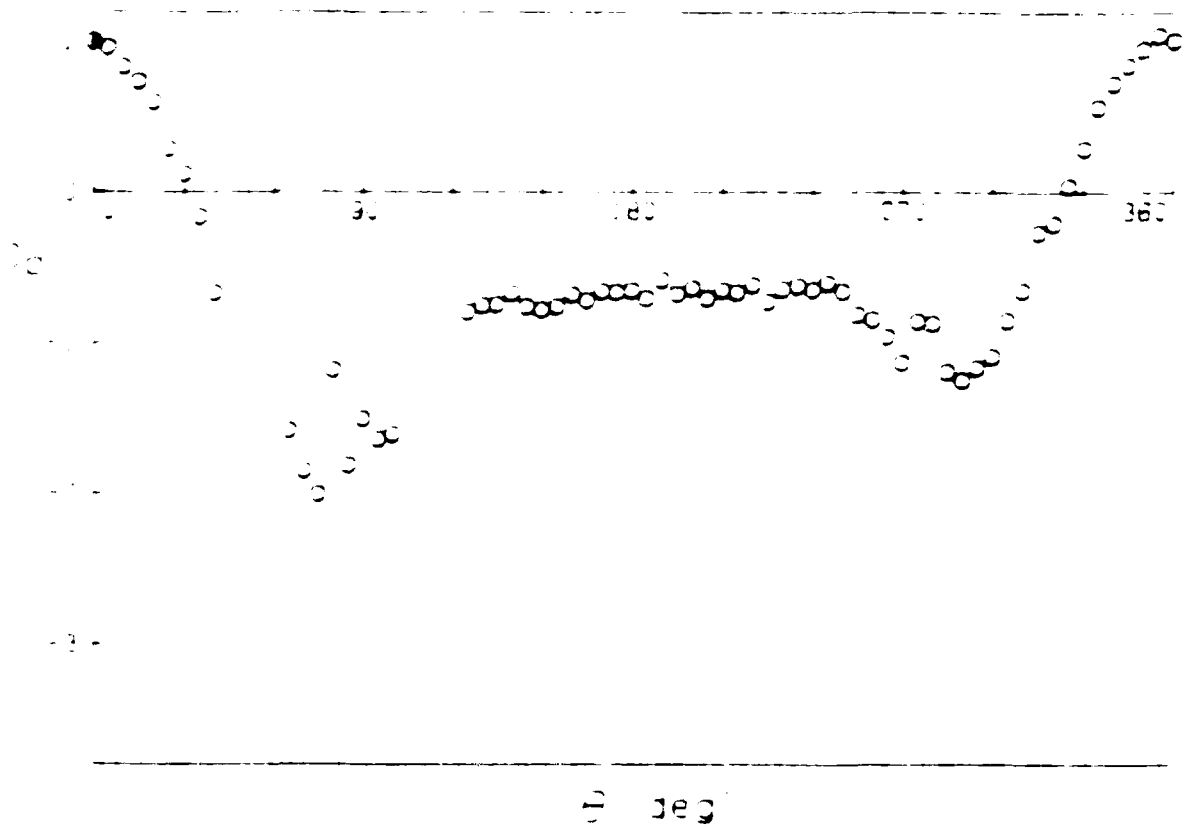
[SMOOTH CYLINDER]

Re= 0.423 x10⁶   k/D= 0.0000   RUN ID= 56

θ (deg)
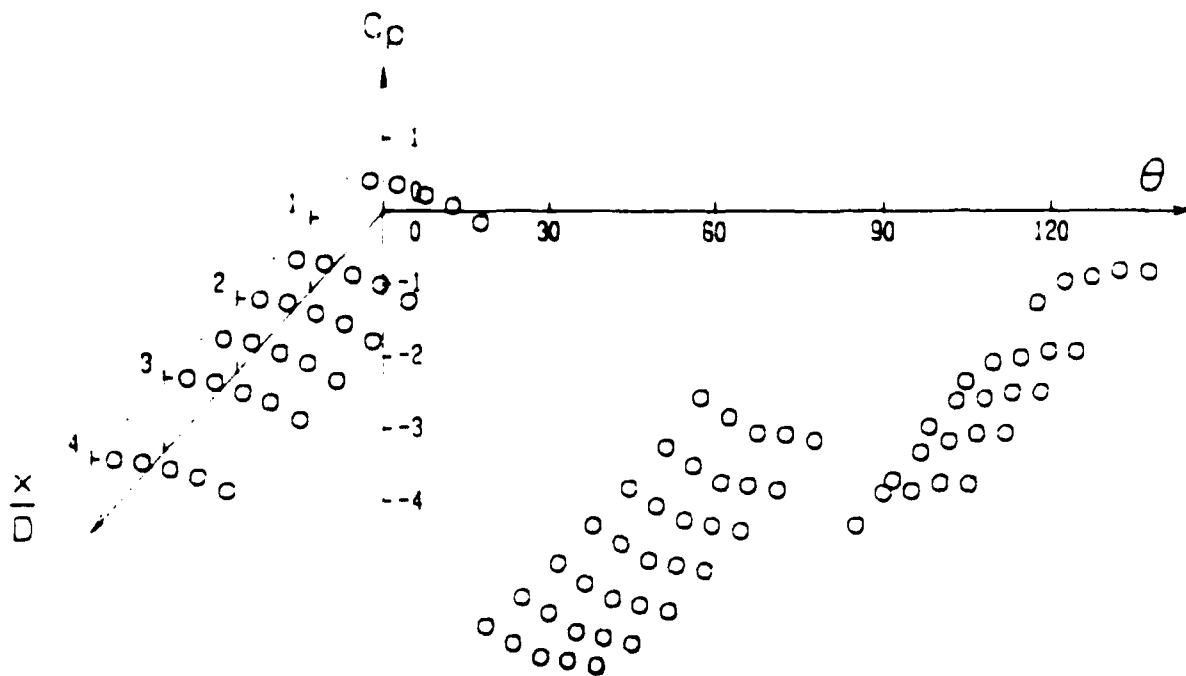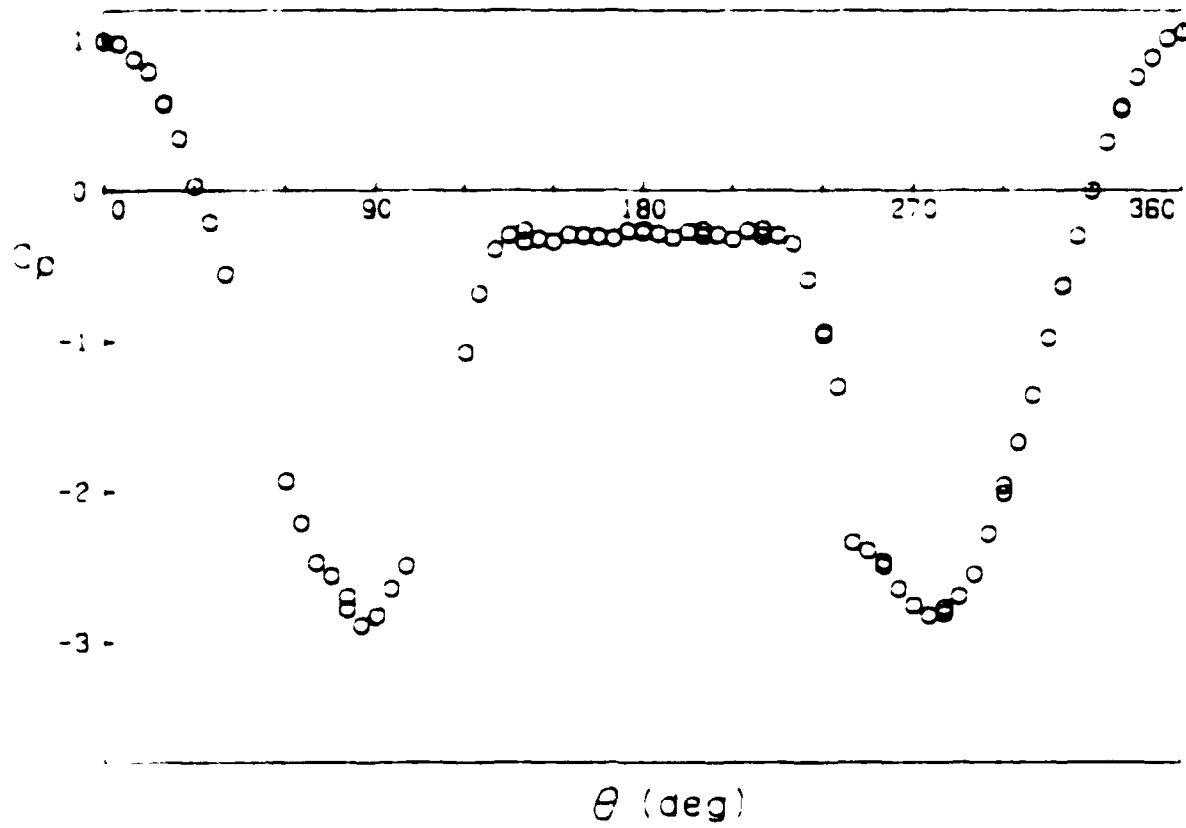
[SMOOTH CYLINDER]

Re= 0.425 ×10⁶   k/D= 0.0000   RUN ID= 68

θ (deg)

I-24
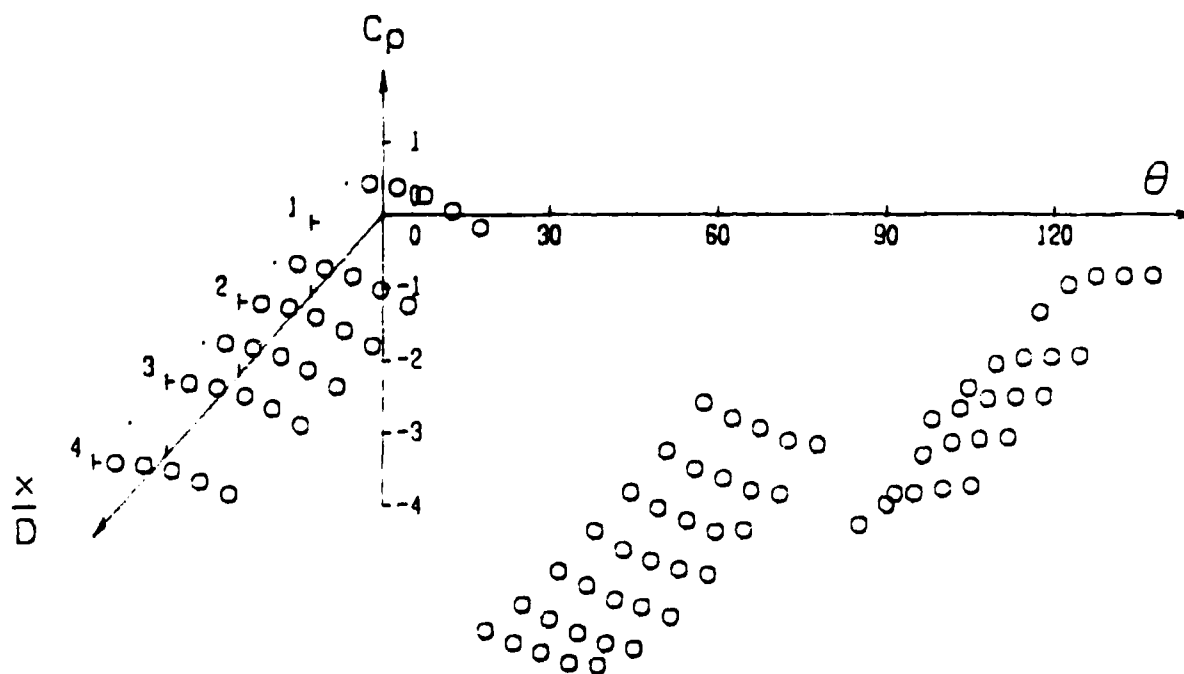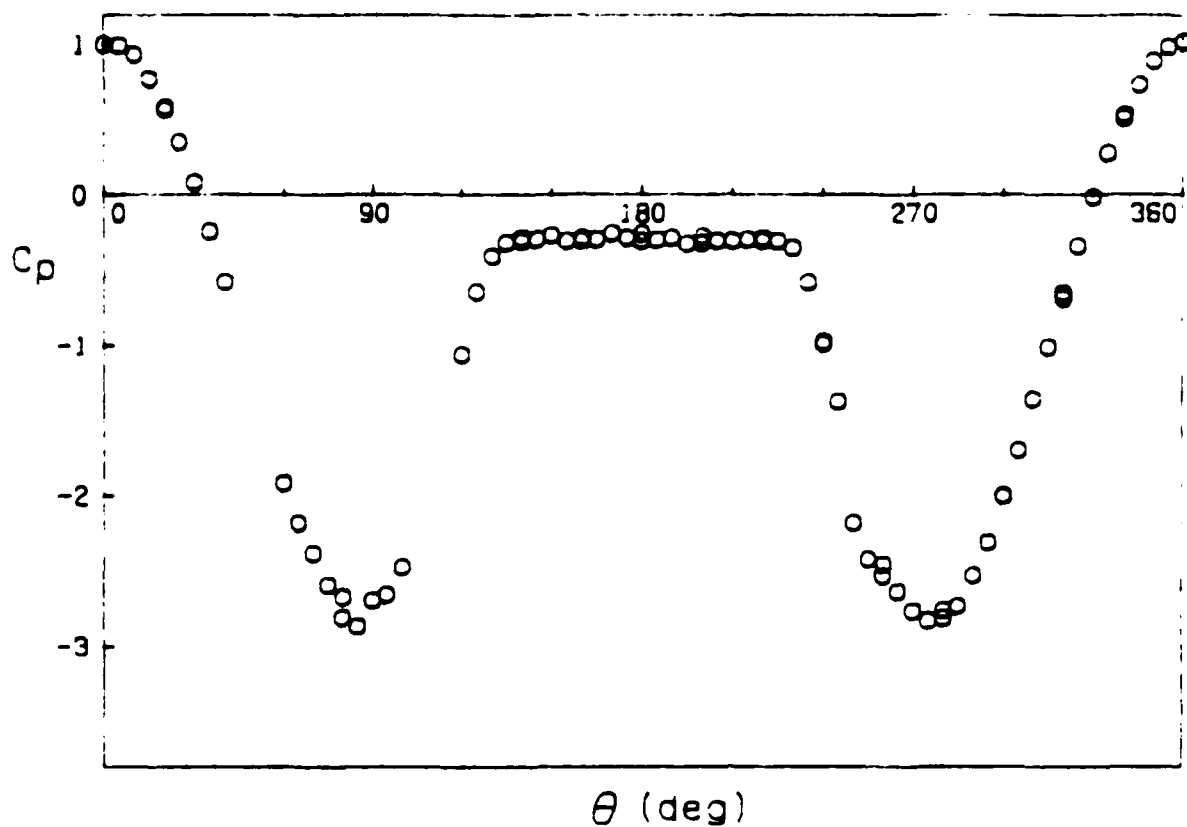
SMOOTH CYLINDER

Re= 0.427 x10⁶   k/D= 0.0000   RUN ID= 55
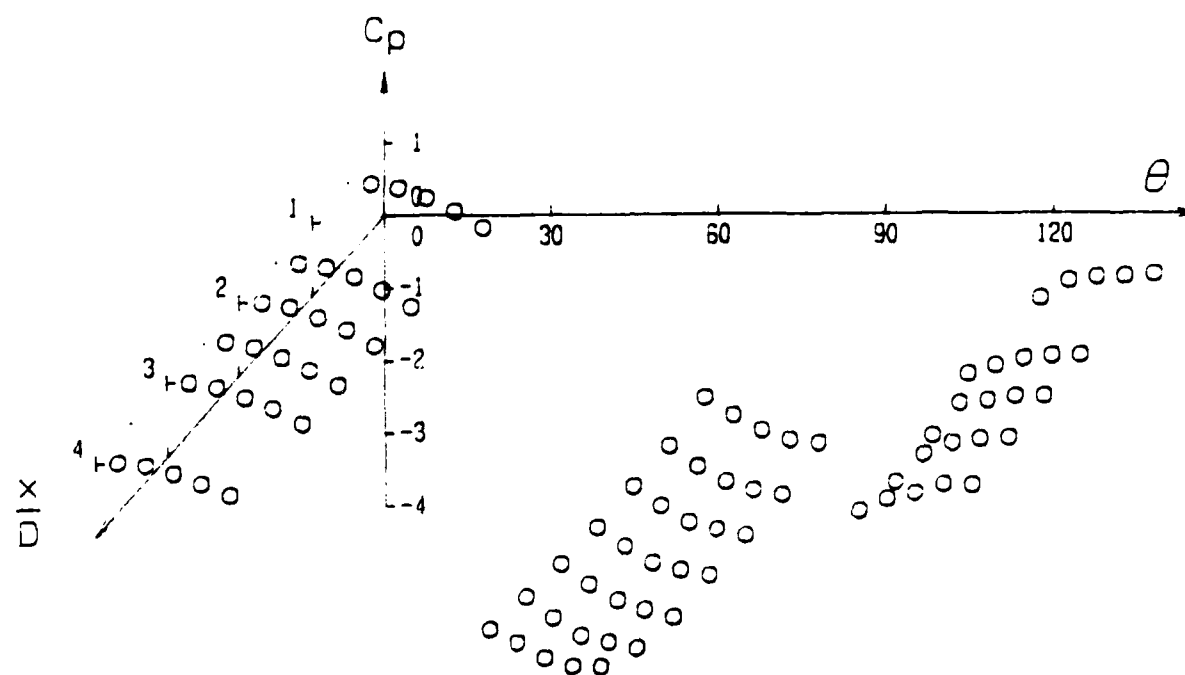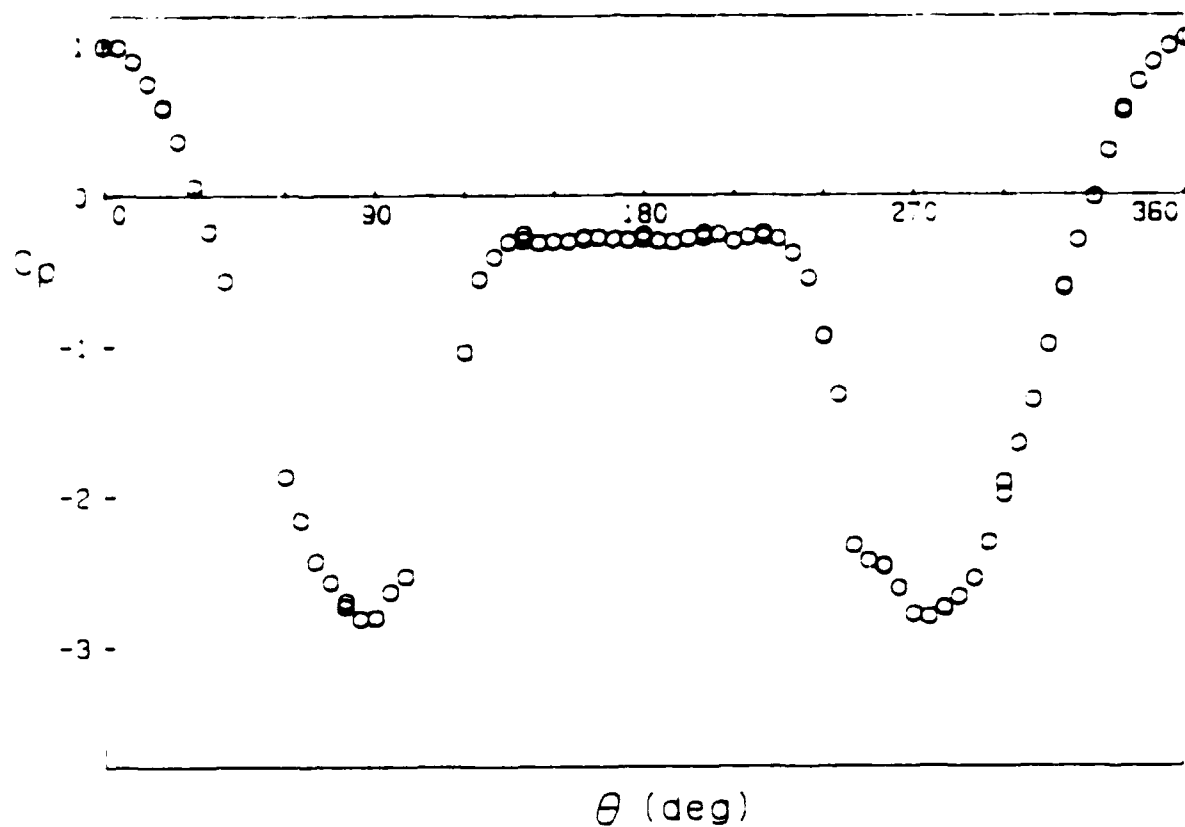
[SMOOTH CYLINDER]

Re= 0.432 x10⁶   k/D= 0.0000   RUN ID= 69

Θ deg
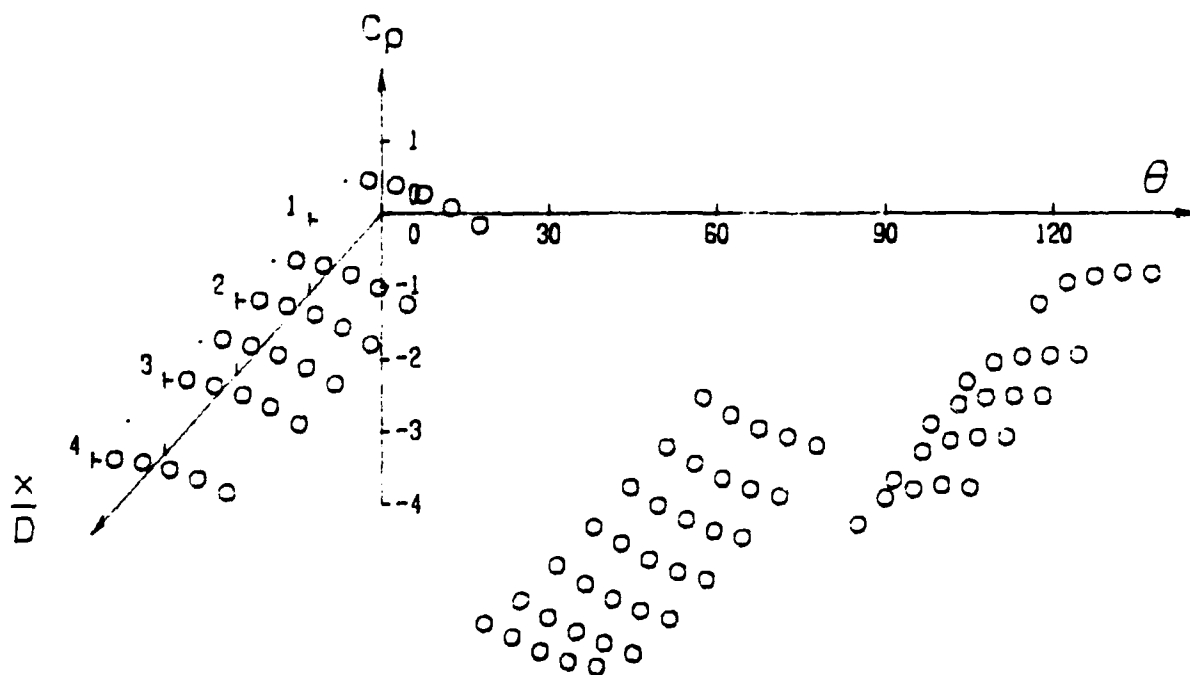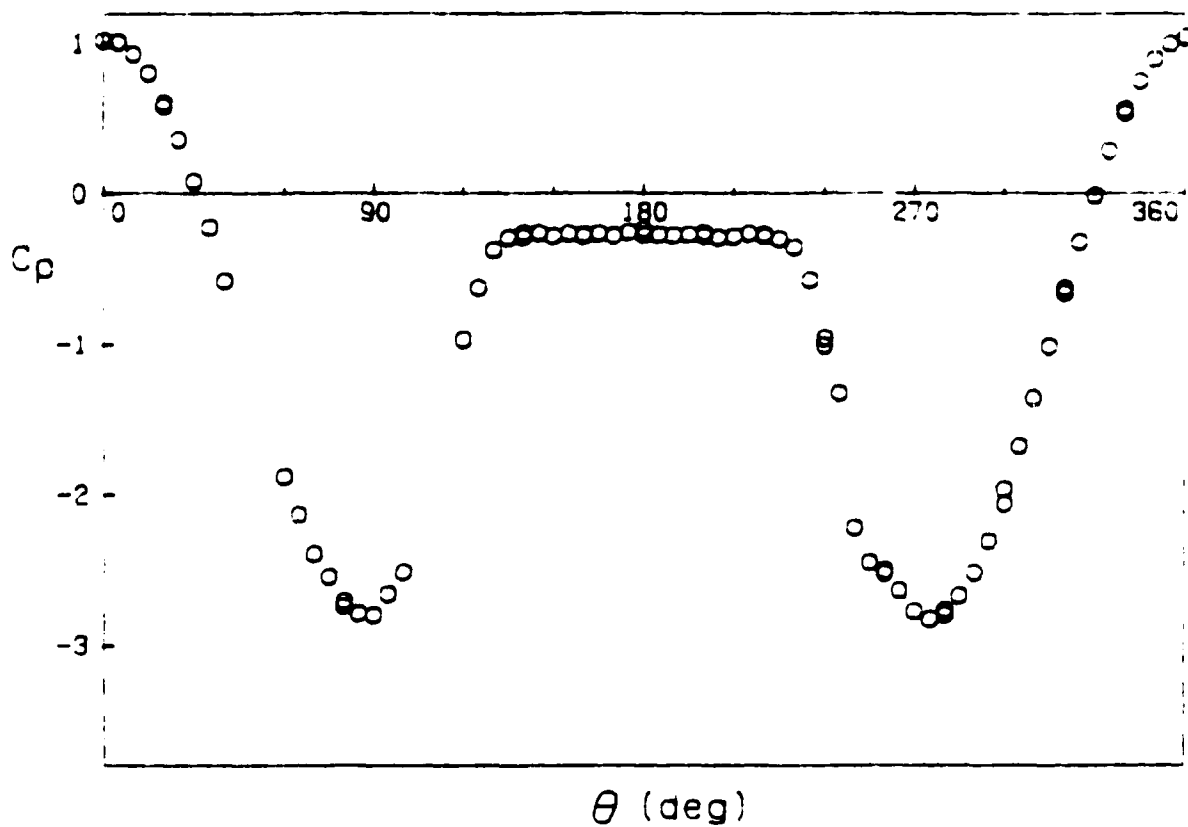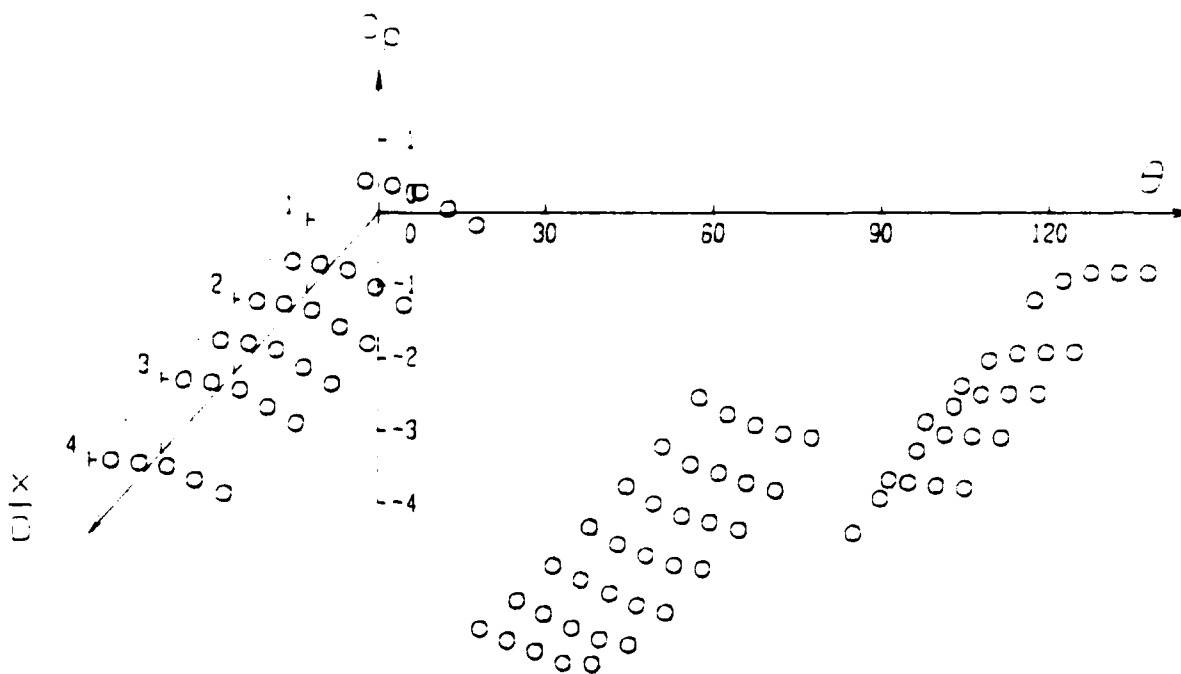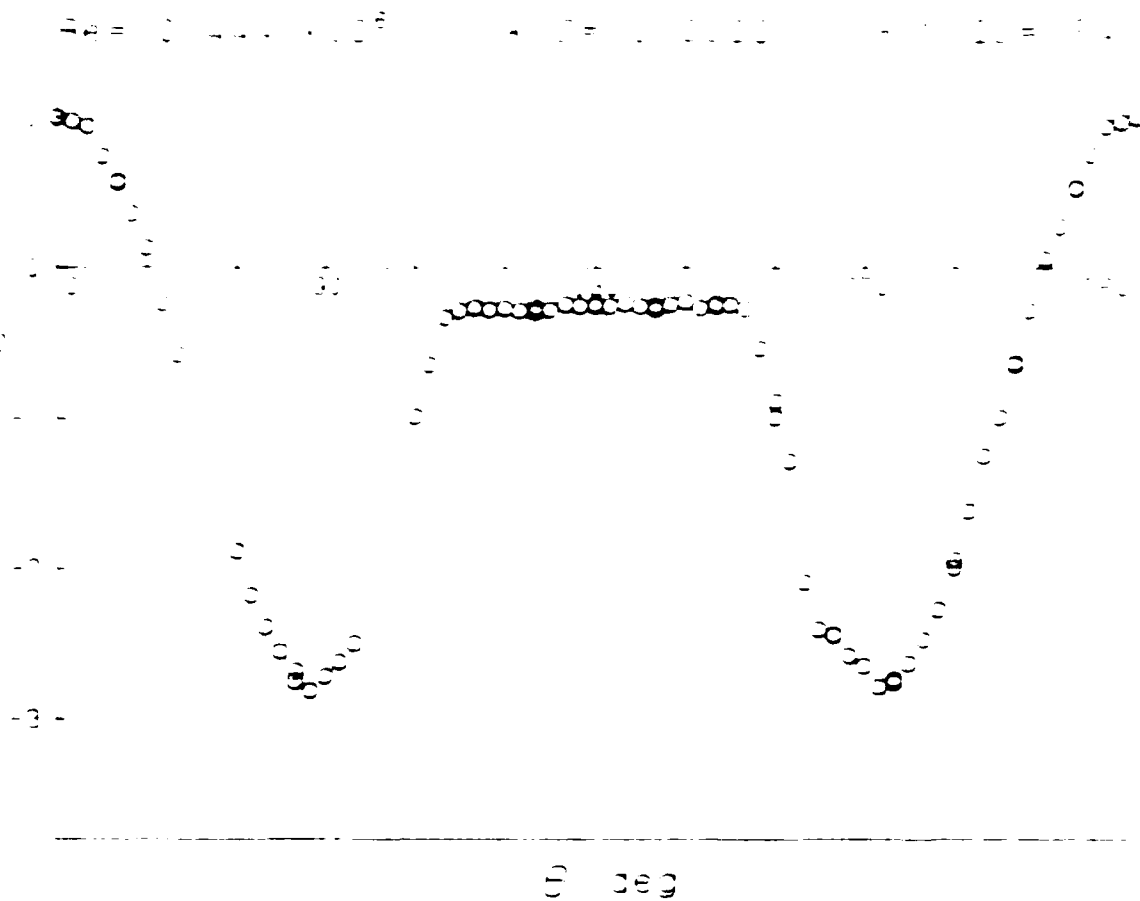
[SMOOTH CYLINDER]

Re= 0.447 x10^6 K/D= 0.0000   RUN ID= 70
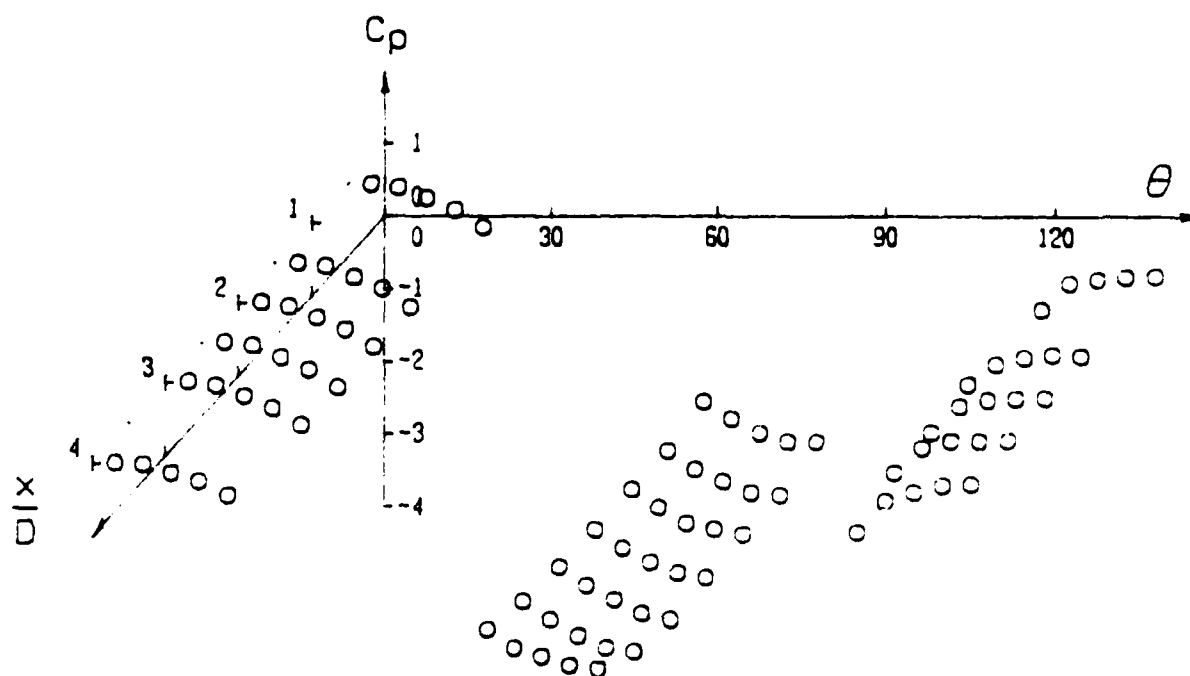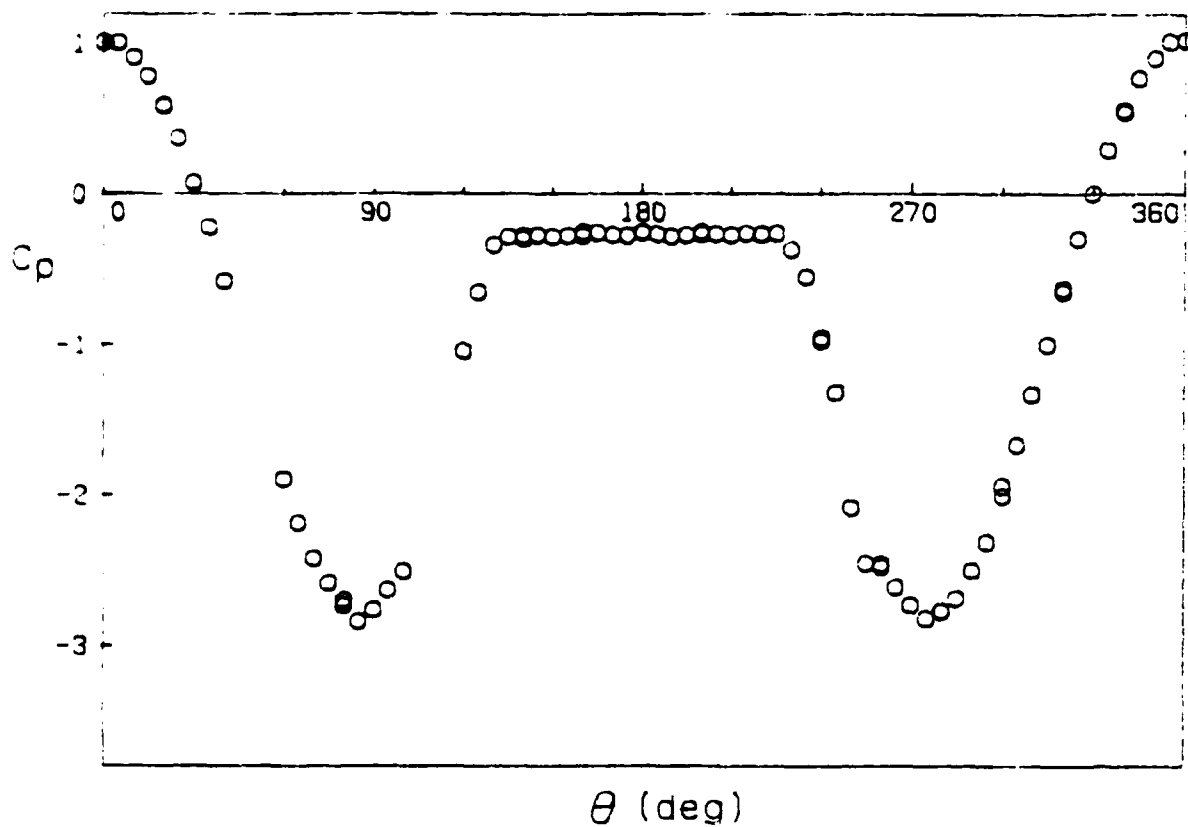
θ (deg)
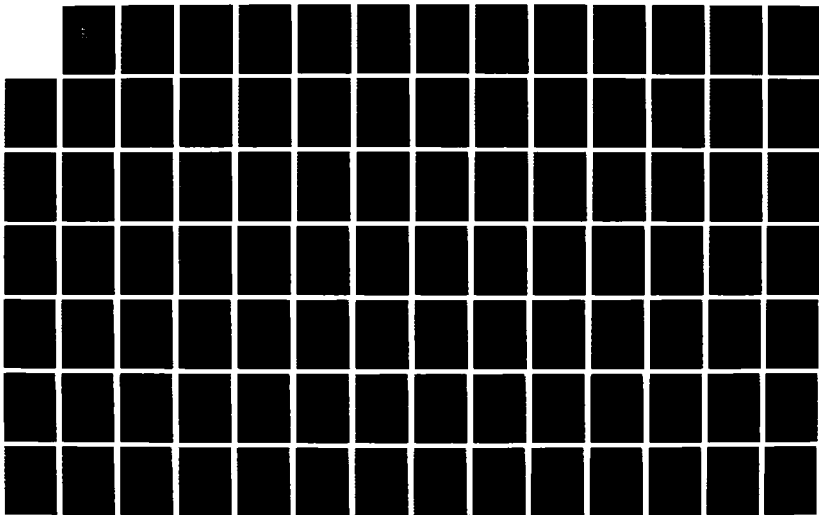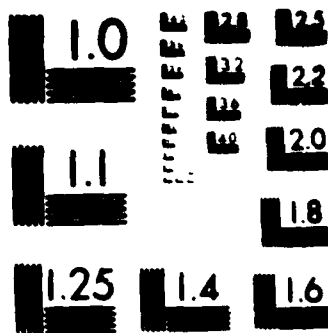
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

[SMOOTH CYLINDER]

Re= 0.463 x10^6 k/D= 0.0000   RUN ID= 53

θ (deg)
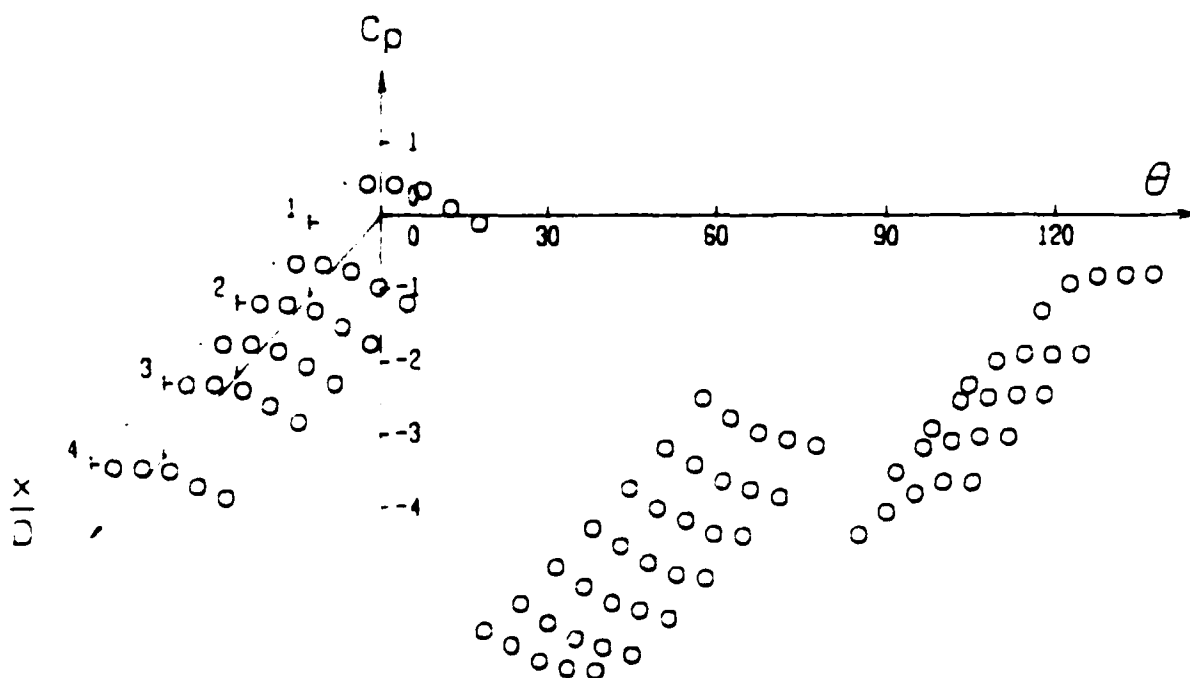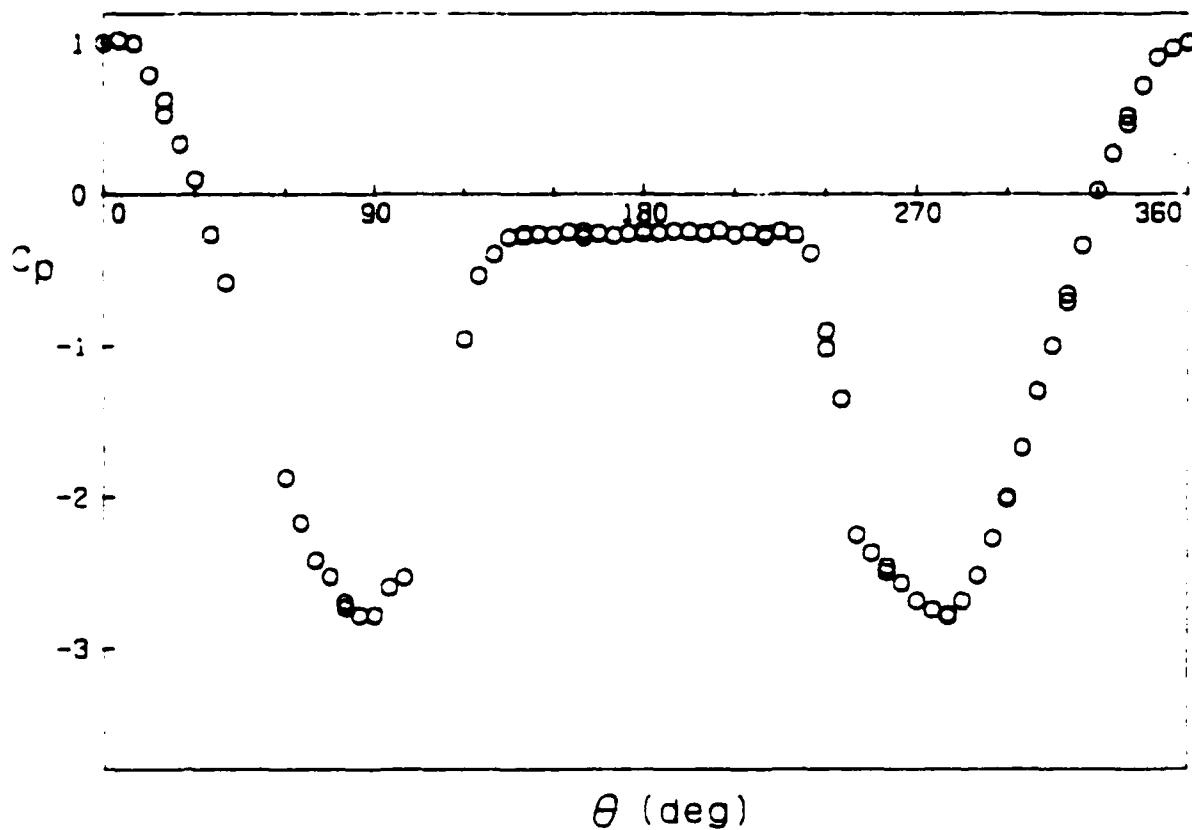
[SMOOTH CYLINDER]

Re= 0.471 ×10^6 k/D= 0.0000   RUN ID= 44
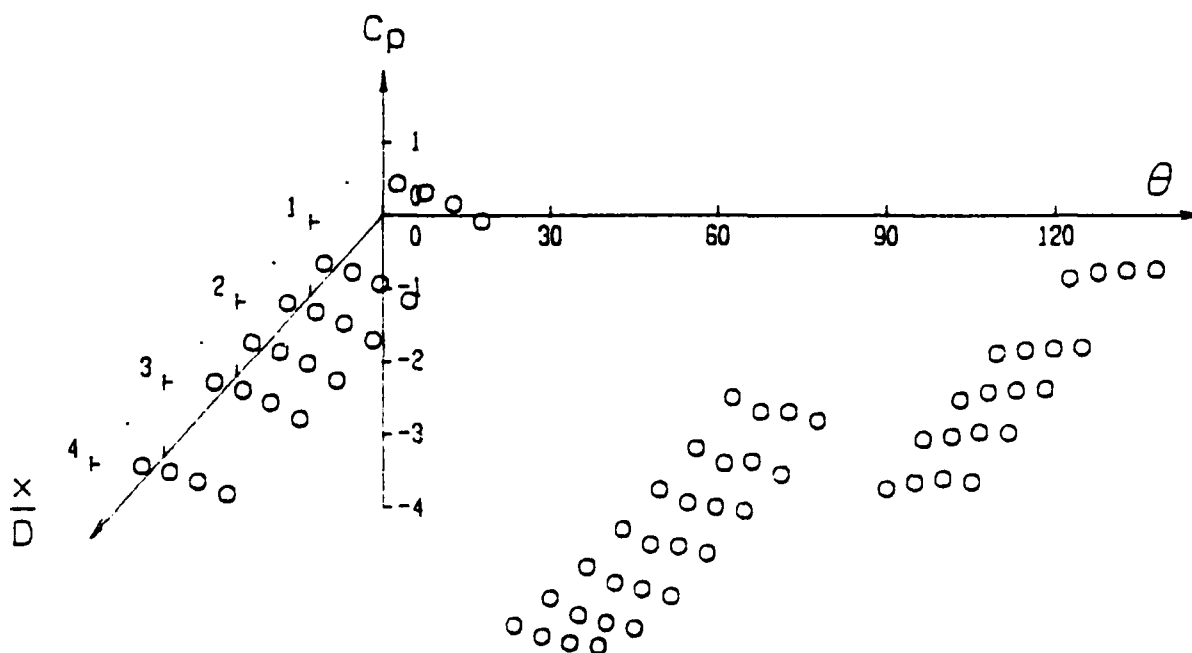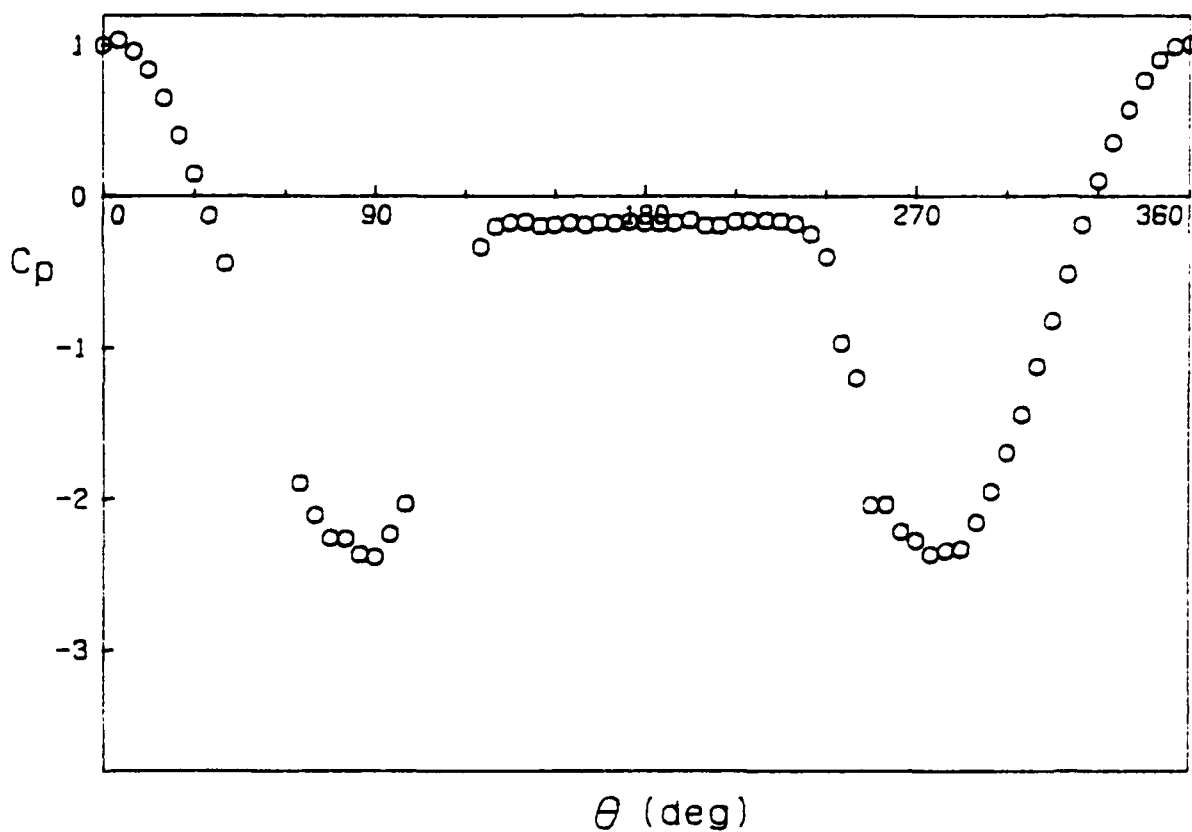
[SMOOTH CYLINDER]

Re= 0.478 x10^6 k/D= 0.0000   RUN ID= 71

C_p

θ (deg)
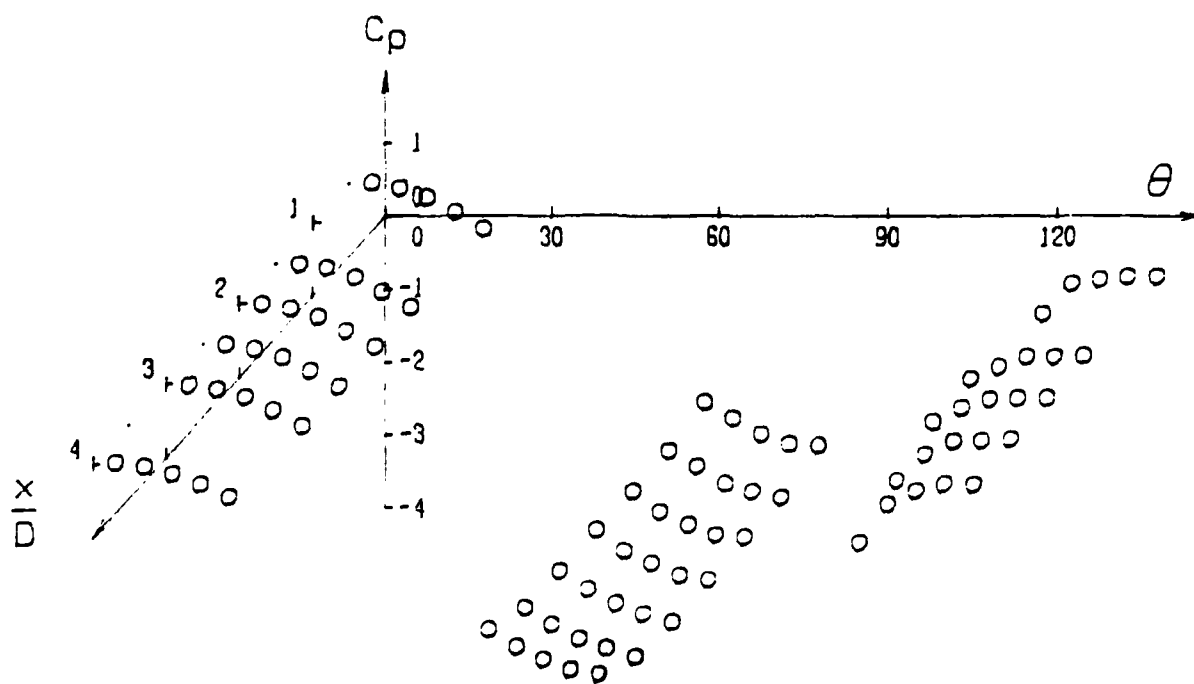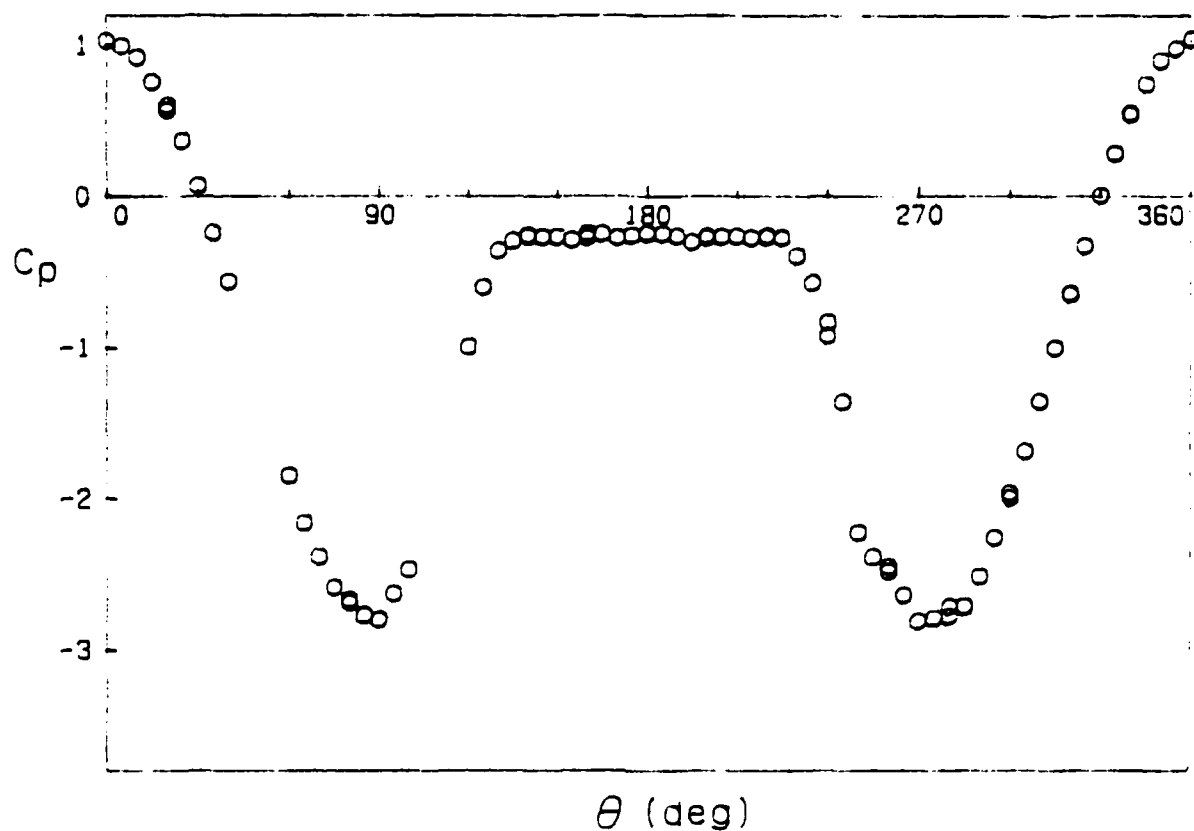
[SMOOTH CYLINDER]

Re= 0.507 x10⁶   K/D= 0.0000   RUN ID= 22
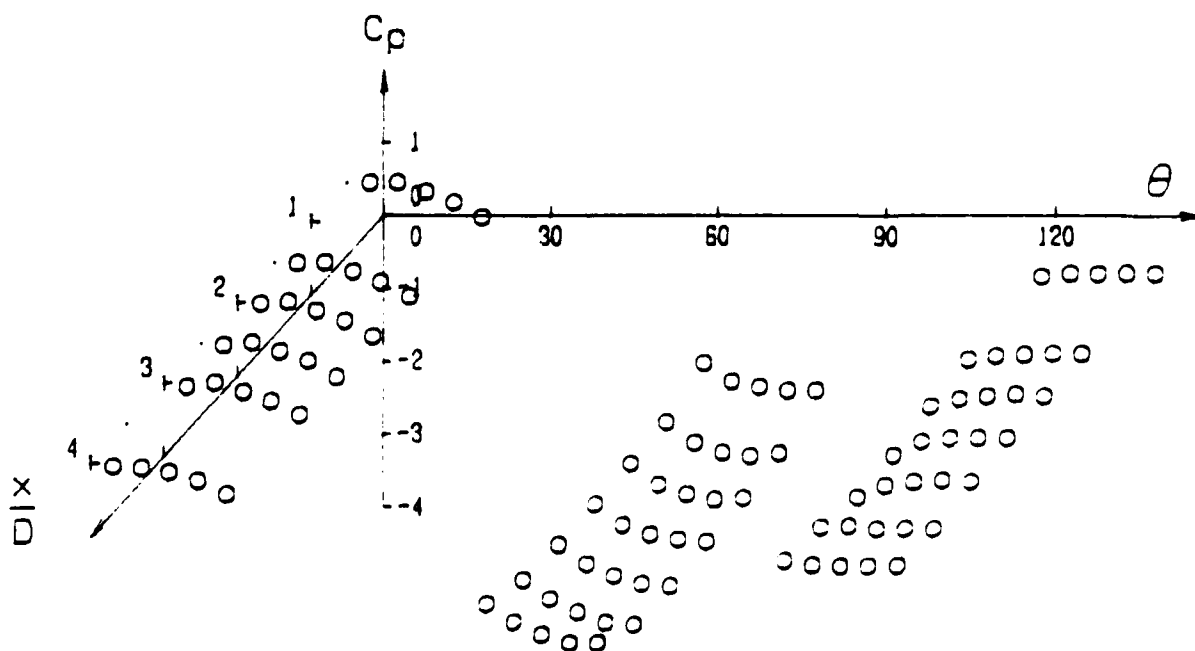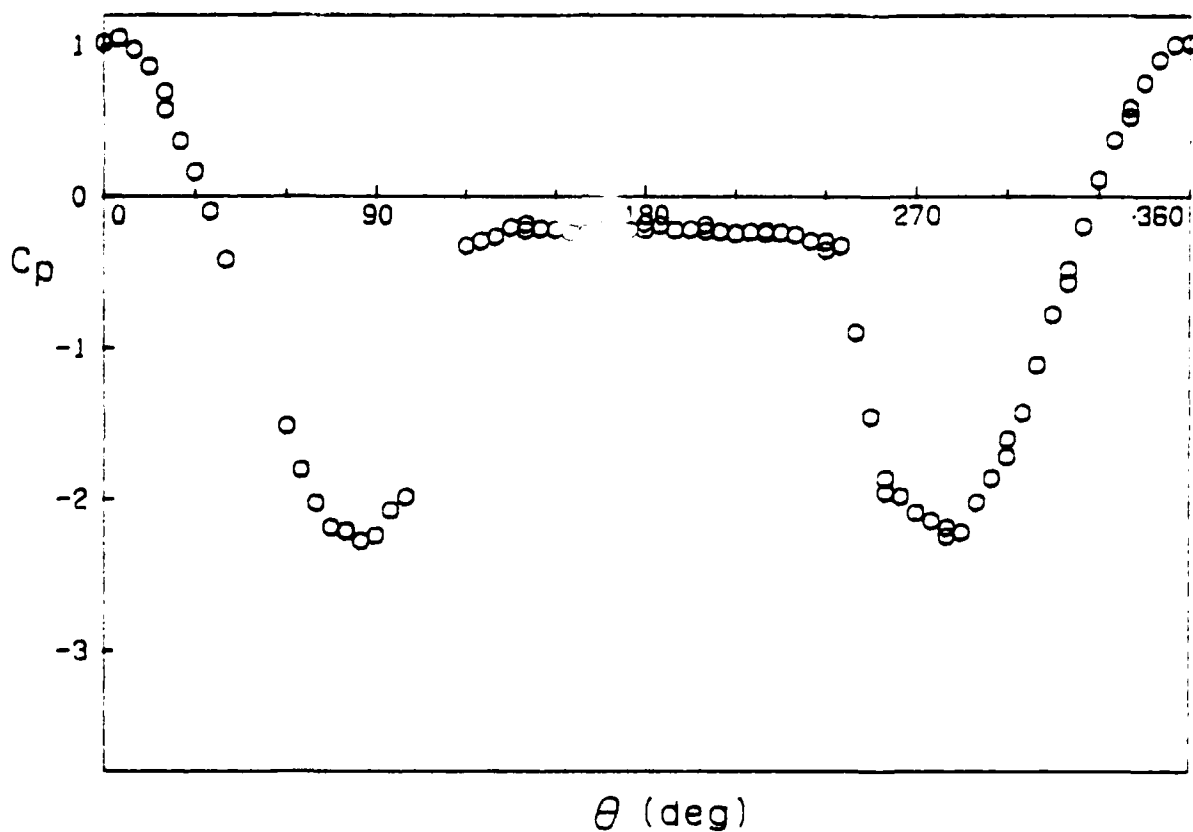
[SMOOTH CYLINDER]

Re= 0.533 ×10⁶   K/D= 0.0000   RUN ID= 52

θ (deg)

I-33
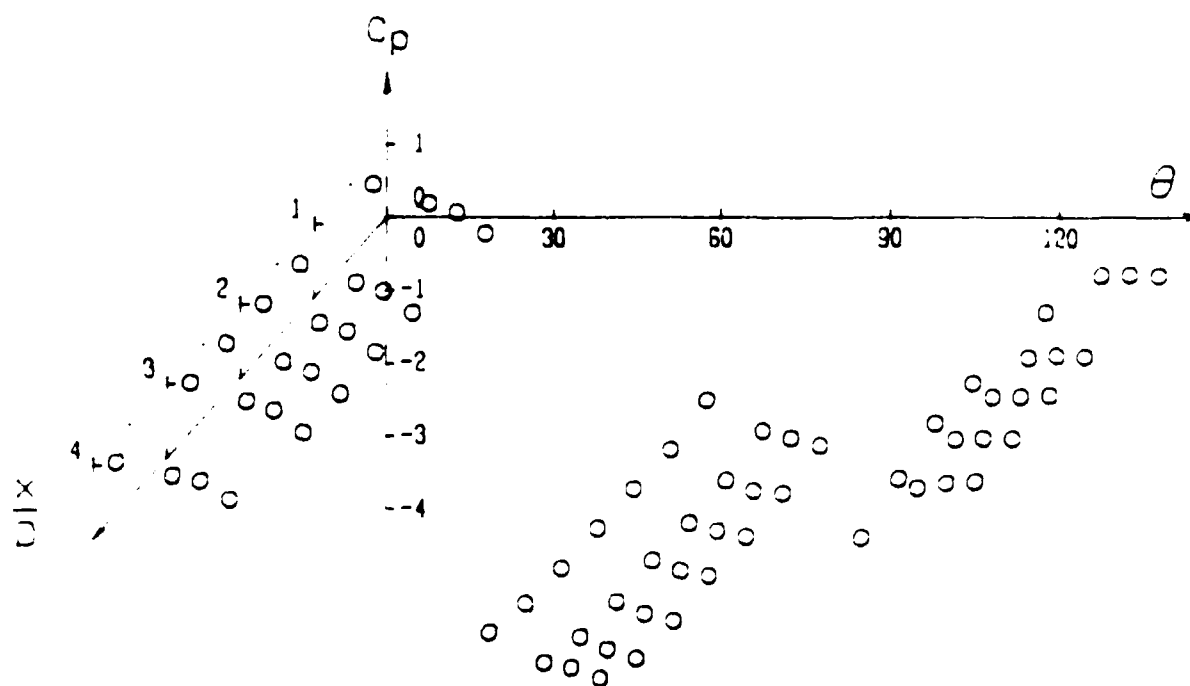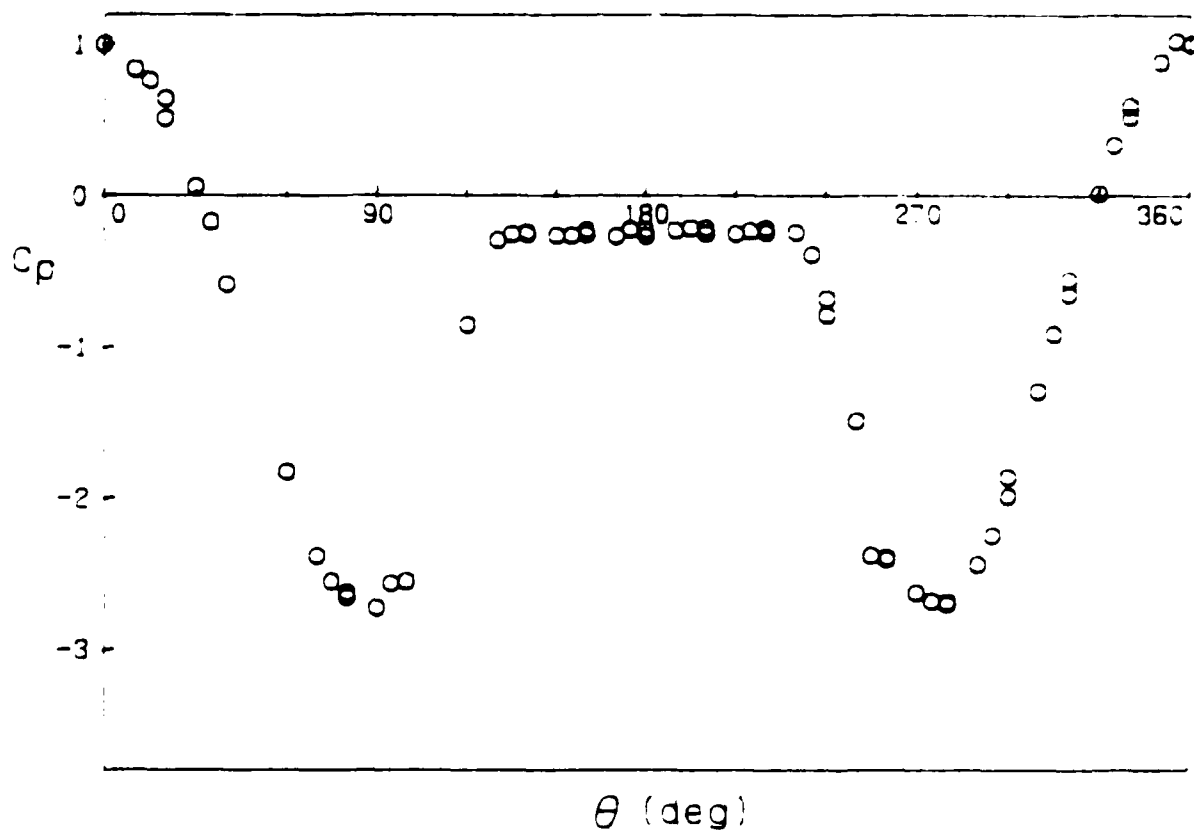
[SMOOTH CYLINDER]

Re= 0.539 ×10⁶   k/D= 0.0000   RUN ID= 72

θ (deg)
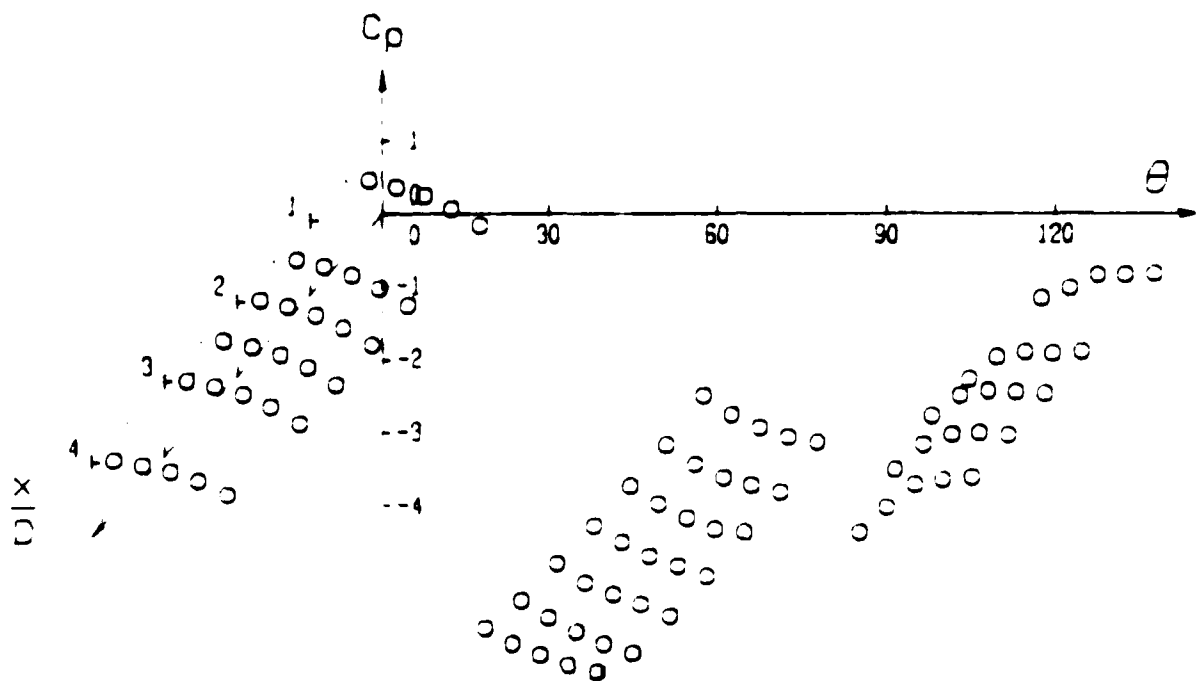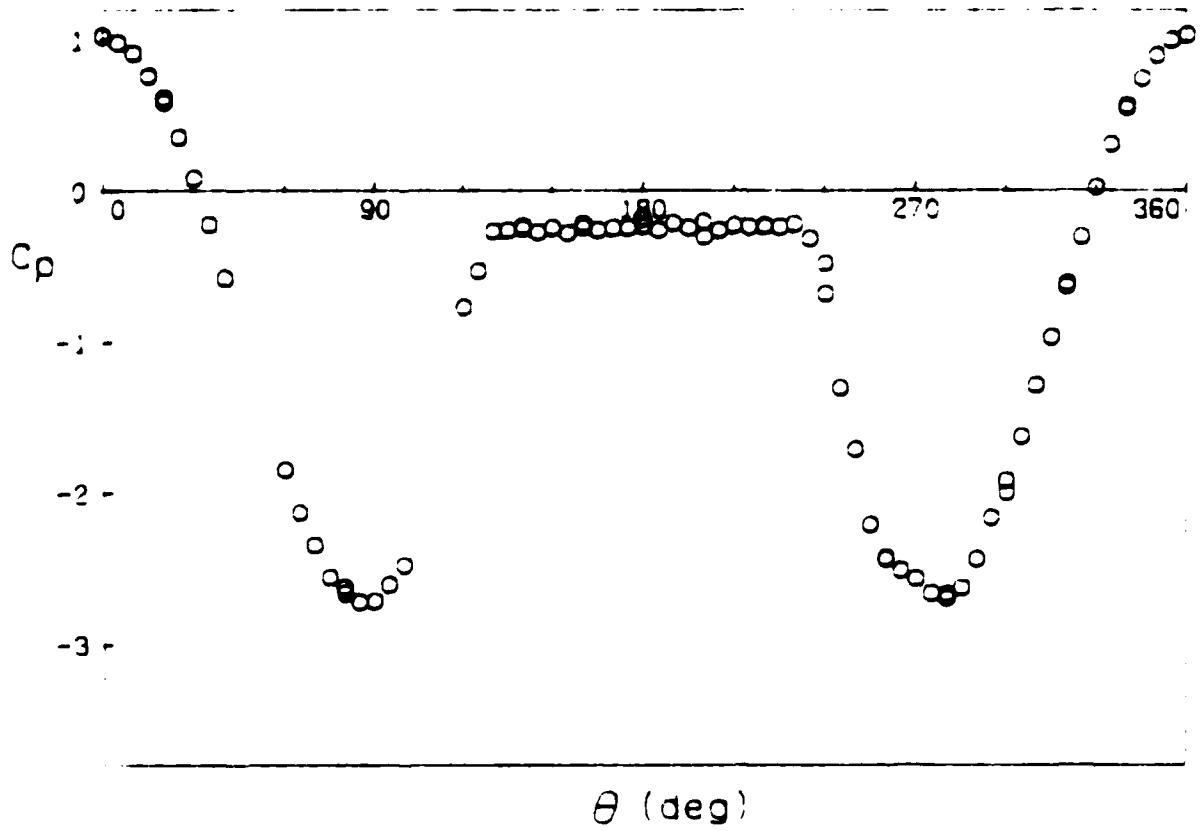
[SMOOTH CYLINDER]

Re= 0.606 ×10⁶   K/D= 0.0000   RUN ID= 23

I-35
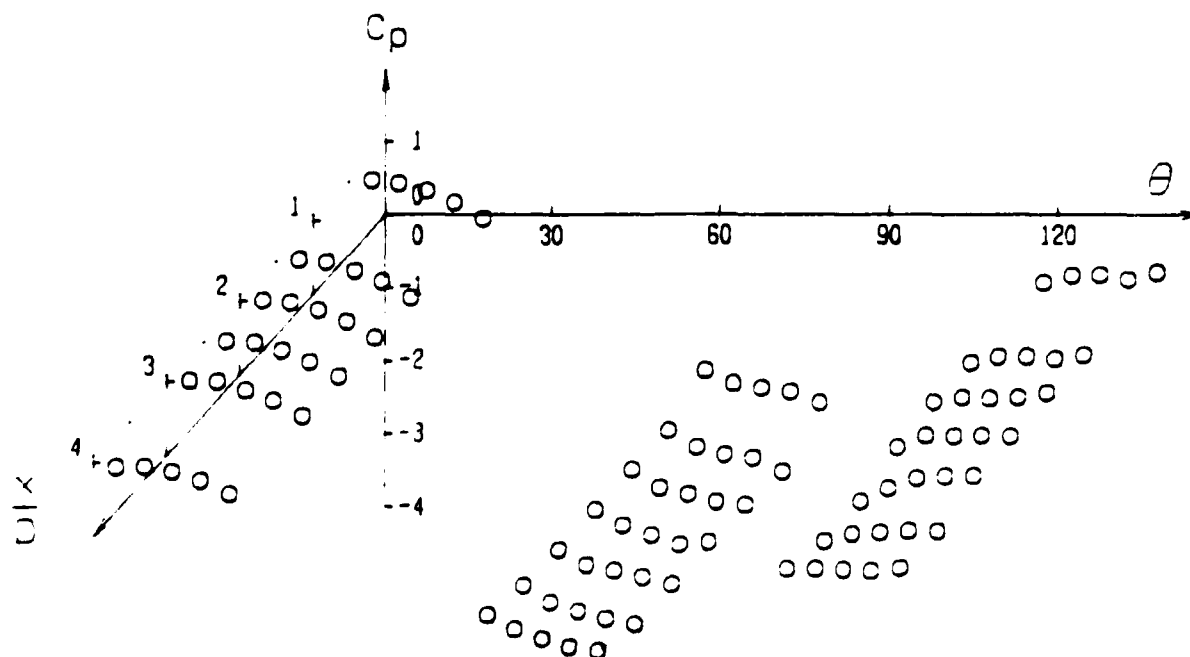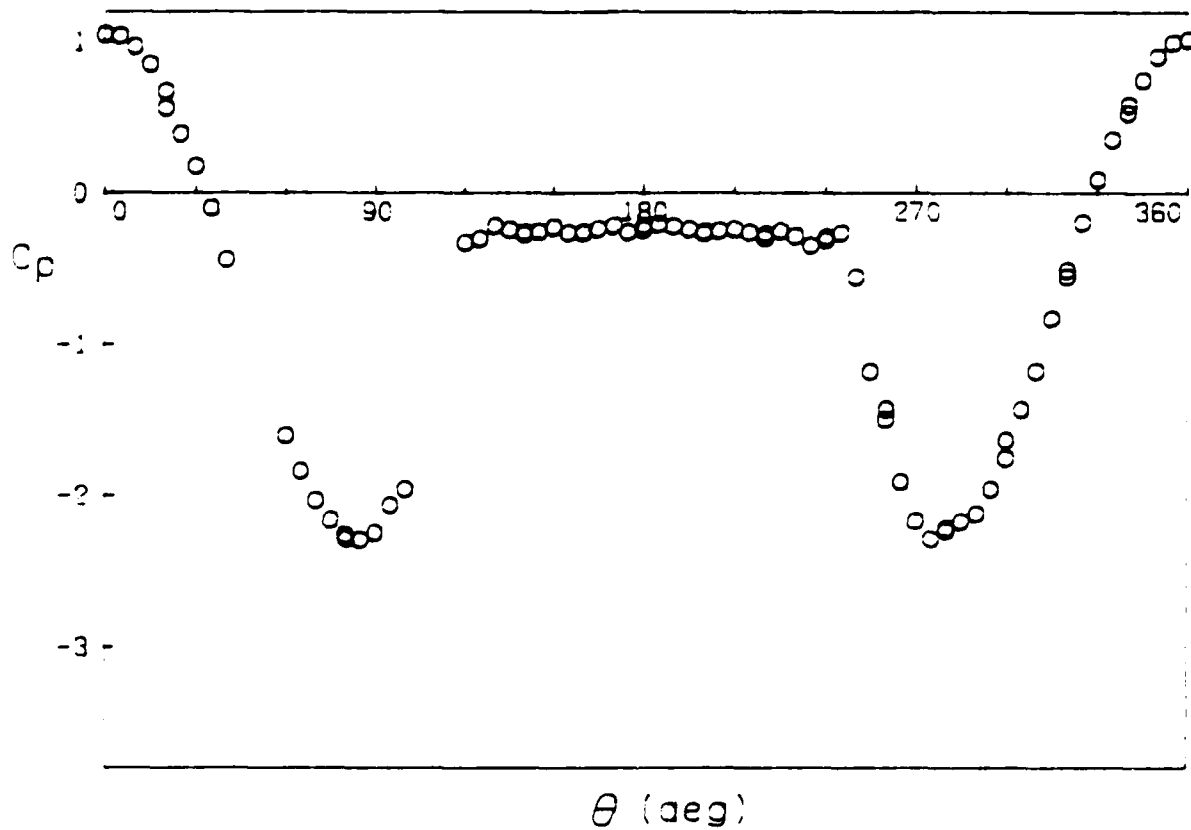
[SMOOTH CYLINDER]

Re= 0.695 x10^6 K/D= 0.0000   RUN ID= 20
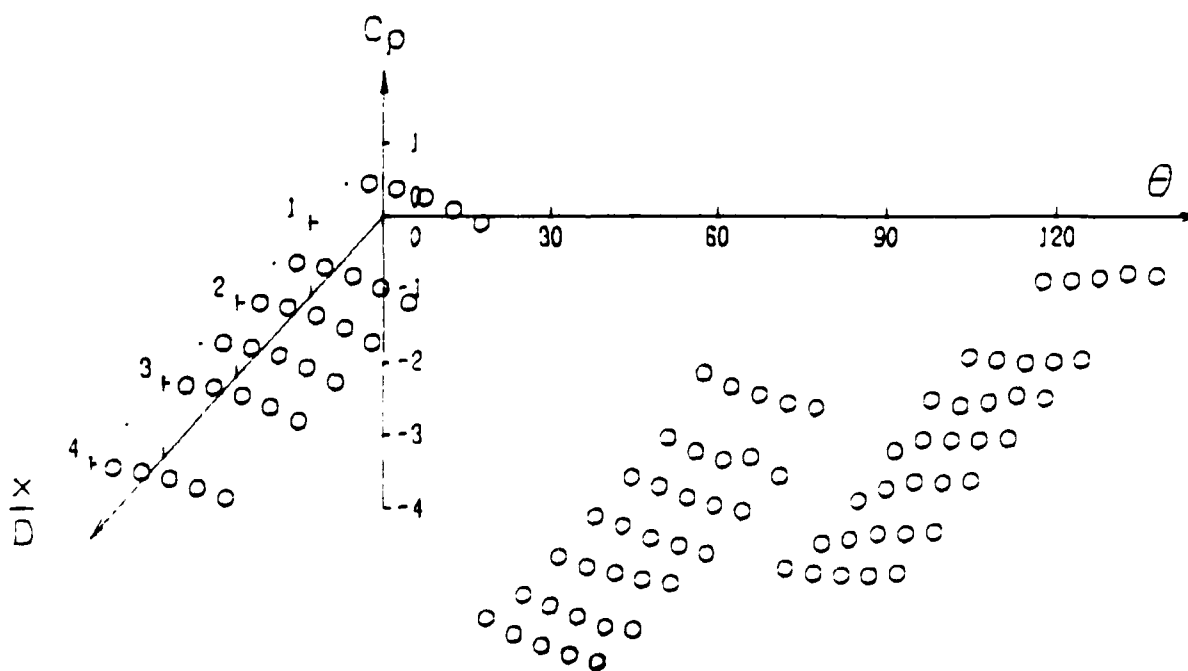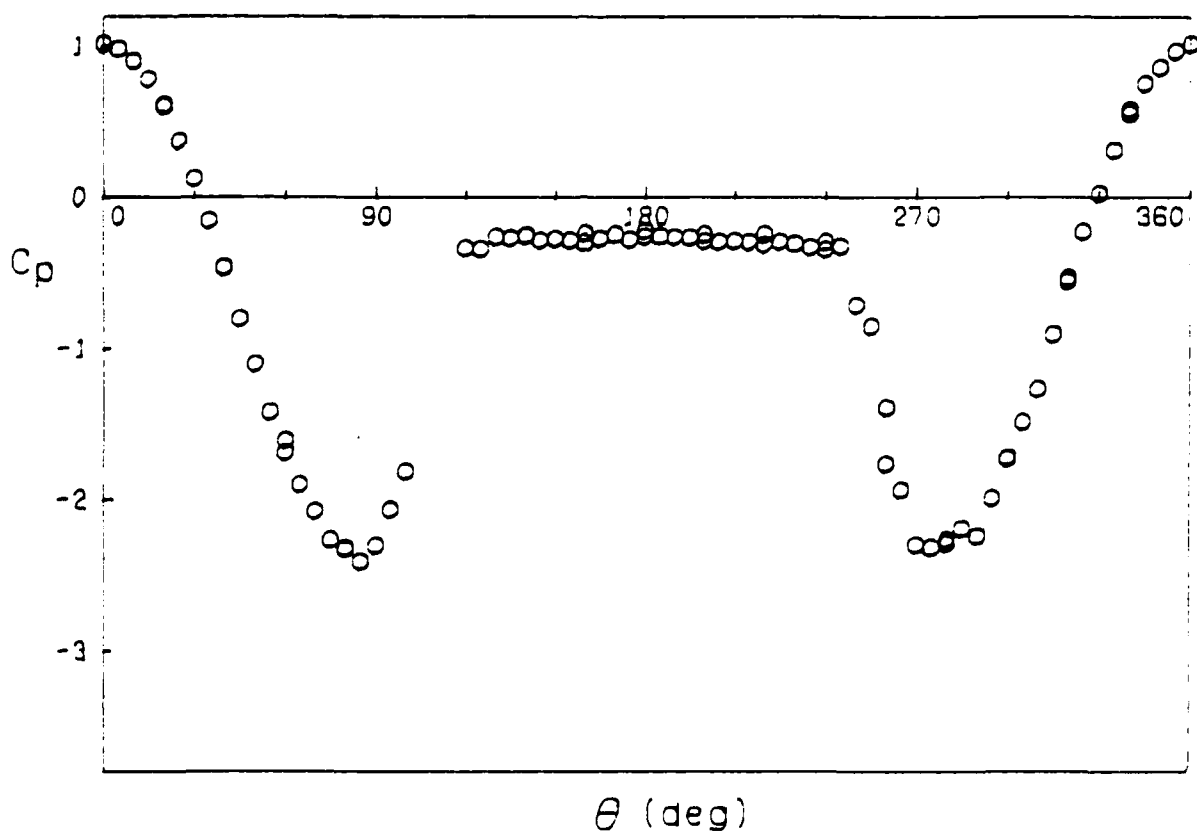
[SMOOTH CYLINDER]

Re= 0.819 ×10⁶   k/D= 0.0000   RUN ID= 103

θ (deg)
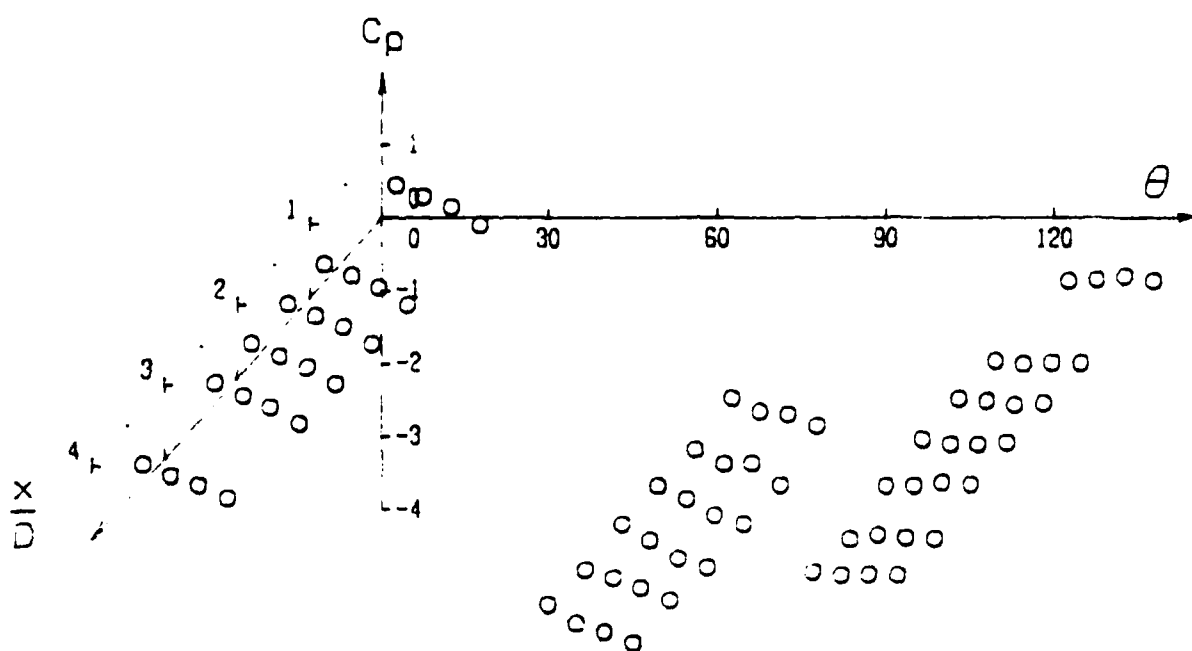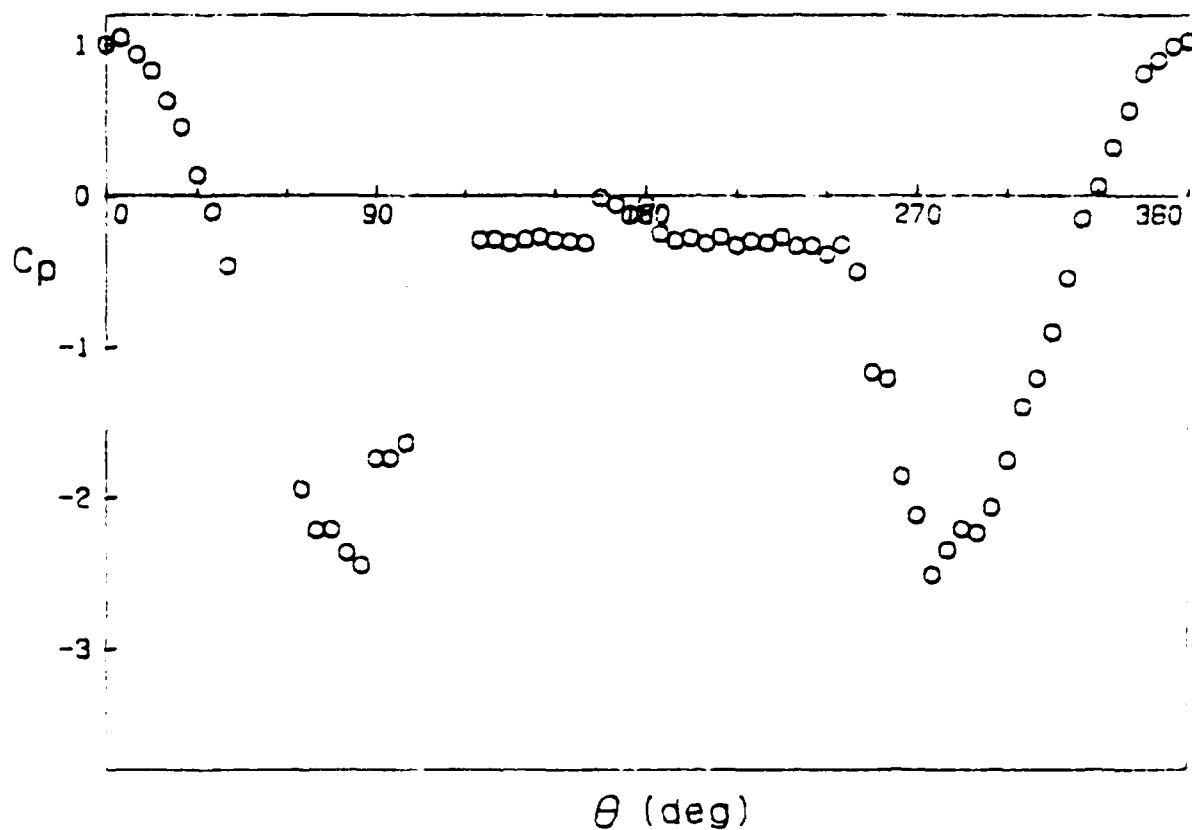
[SMOOTH CYLINDER]

Re= 0.891 x10⁶   K/D= 0.0000   RUN ID= 18

θ (deg)
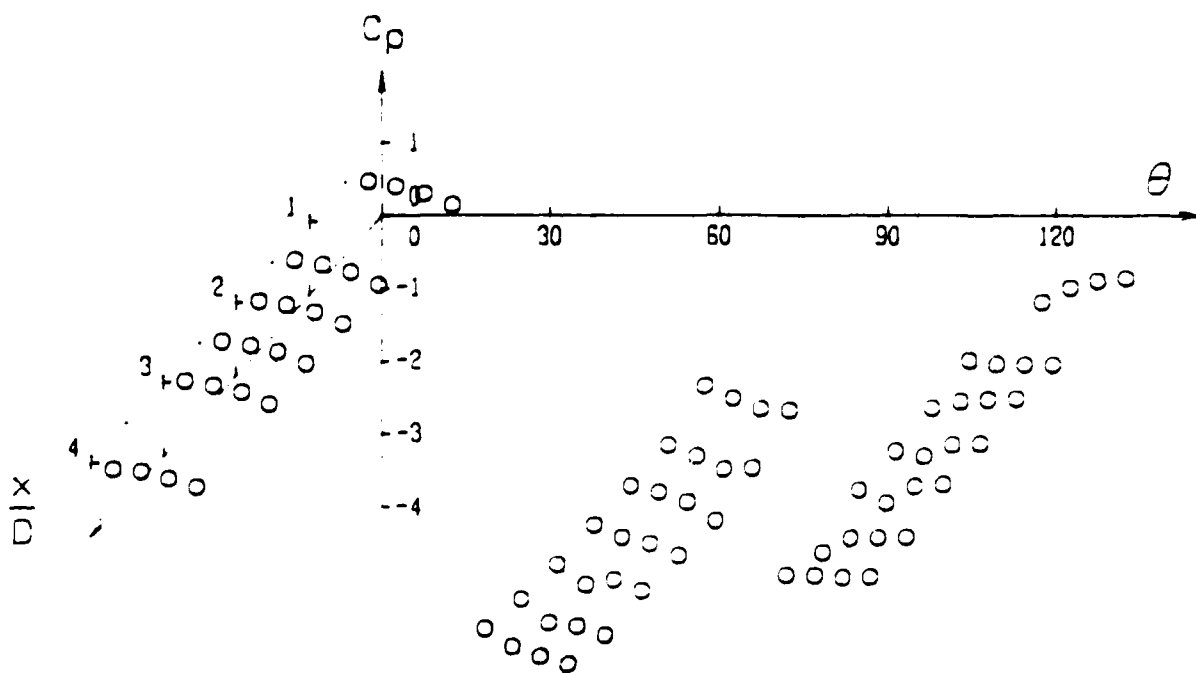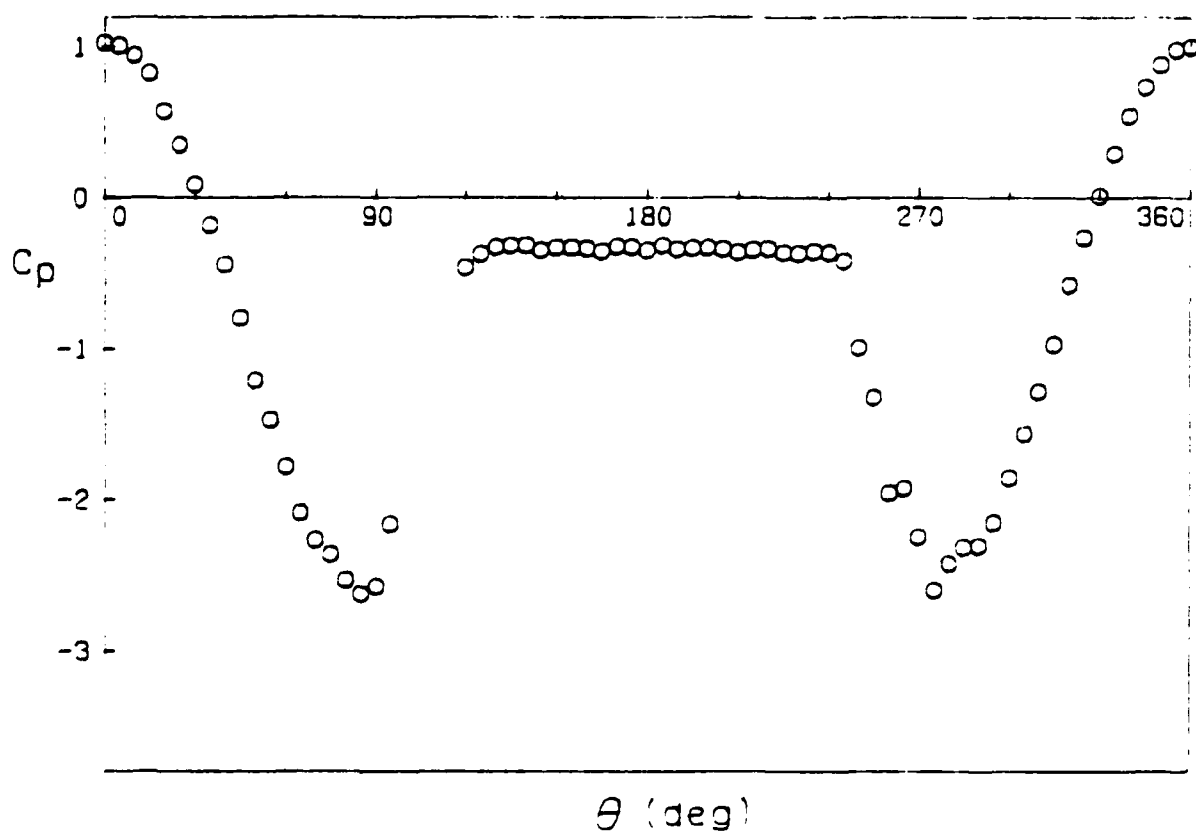
SMOOTH CYLINDER

Re= 1.266 x10⁶   K/D= 0.0000   RUN ID= 18
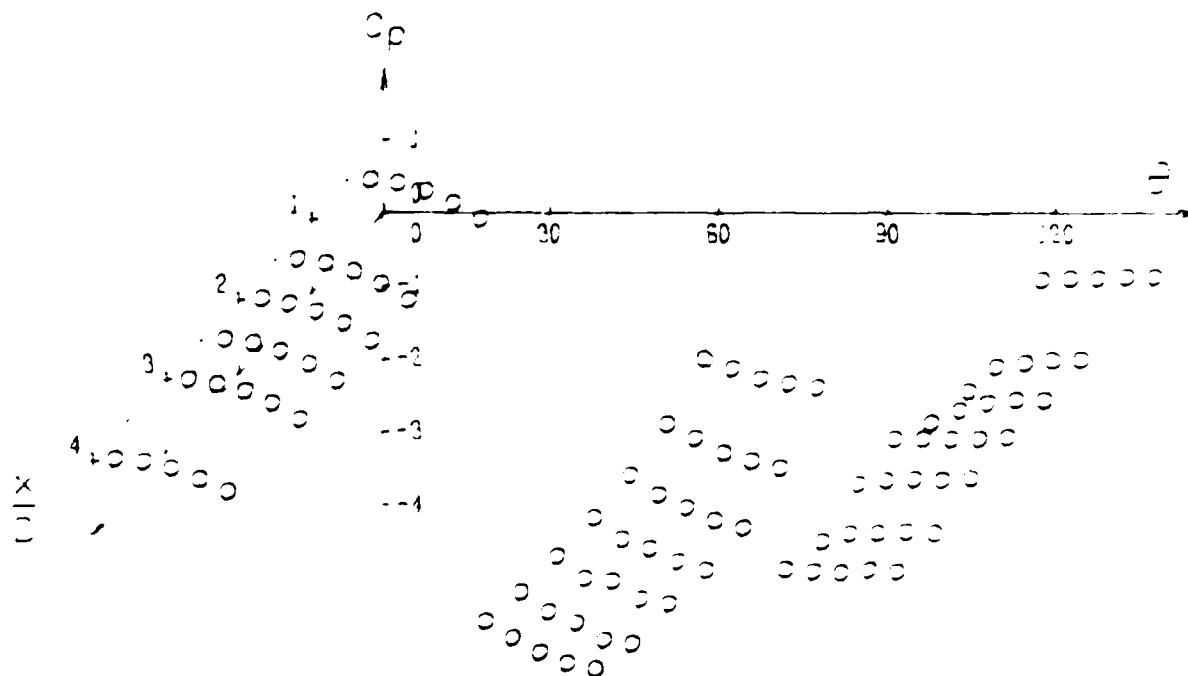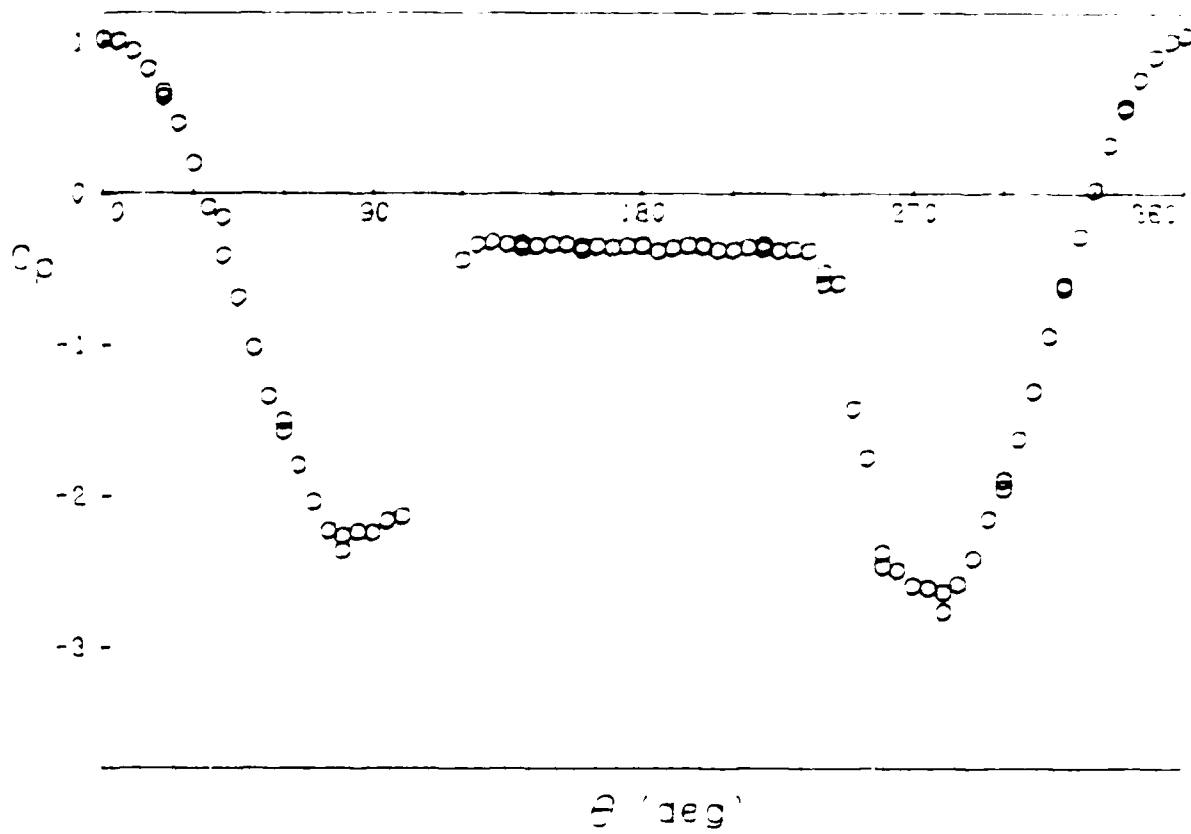
SMOOTH CYLINDER

Re= 1 5.13 ×10⁶   k/D= 0.0000   RUN ID= 15

θ (deg)
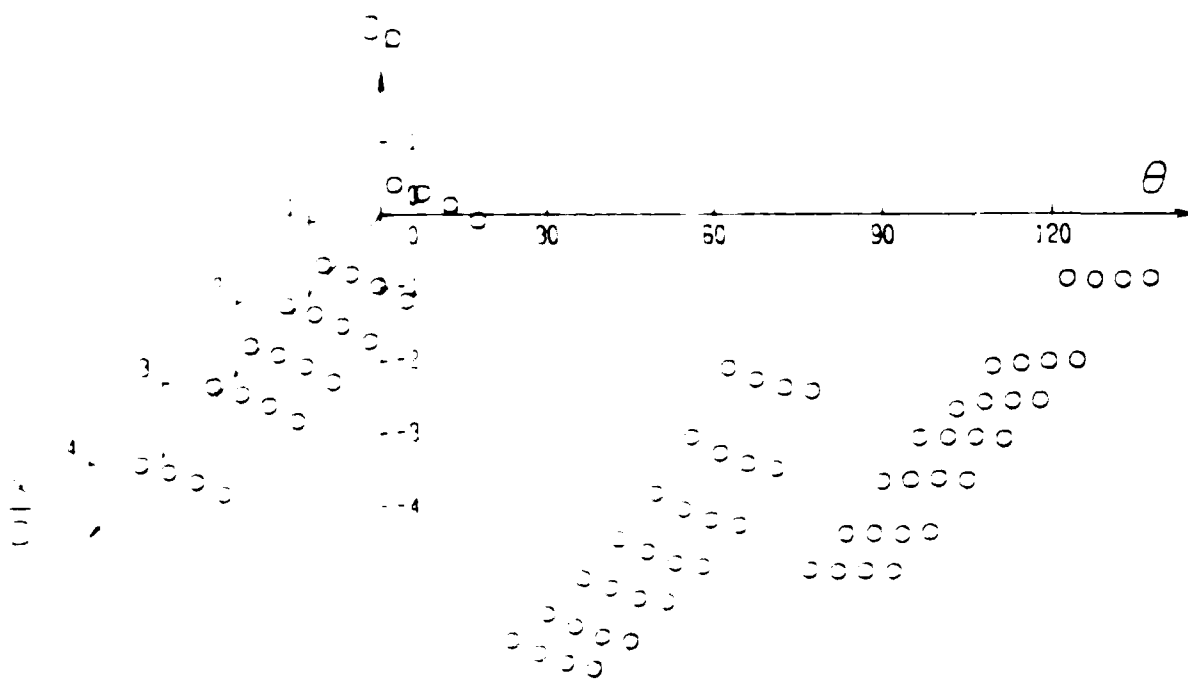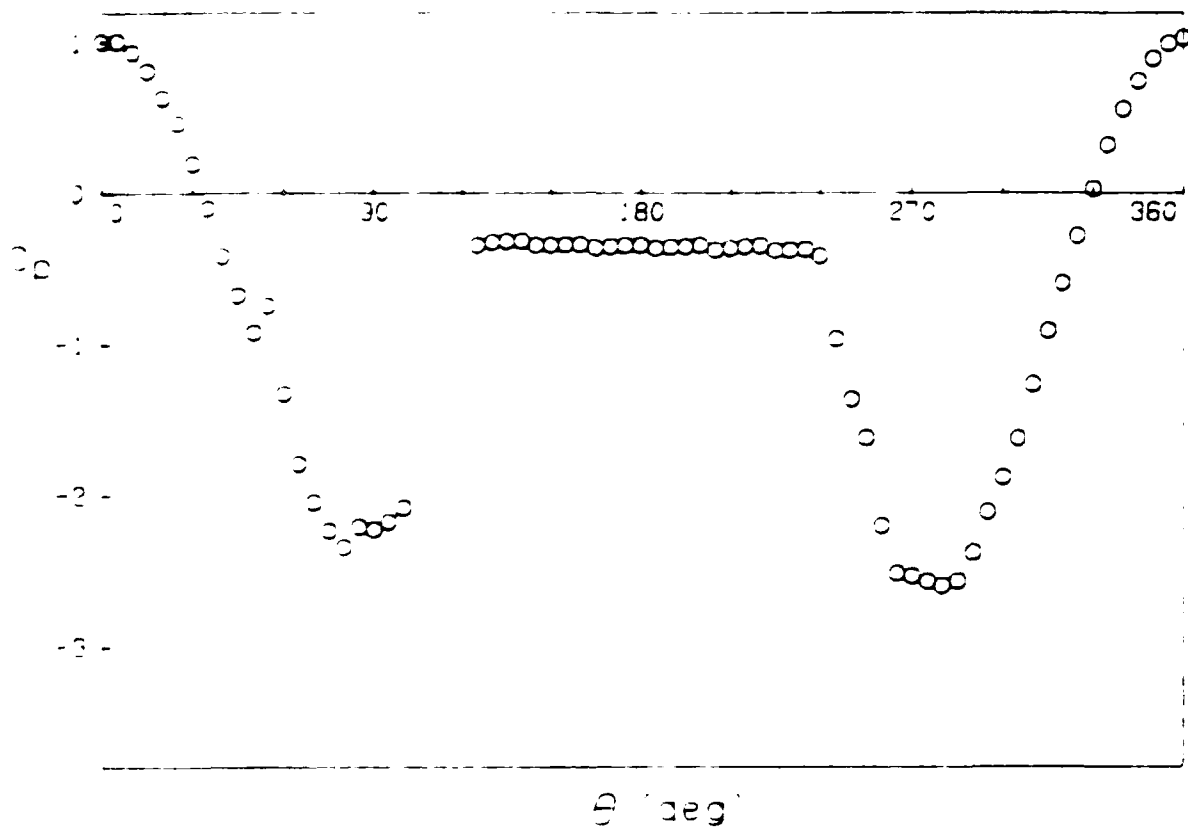
[SMOOTH CYLINDER]

Re= 1.992 ×10⁶   k/D= 0.0000   RUN ID= 14

θ (deg)
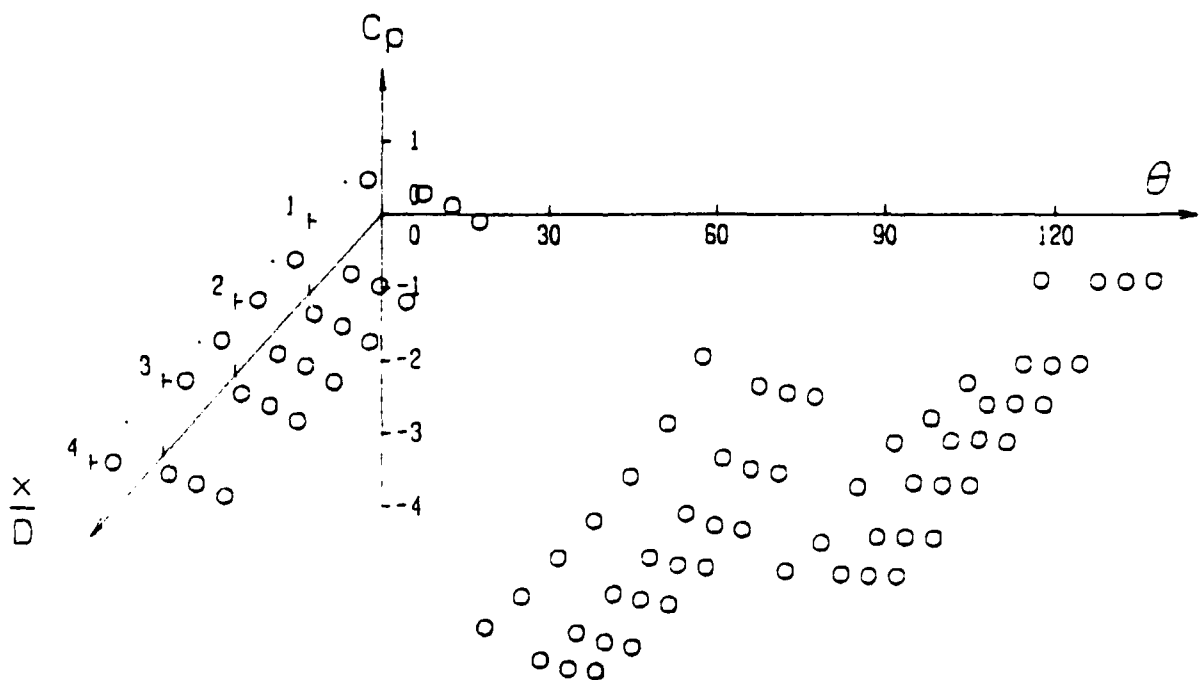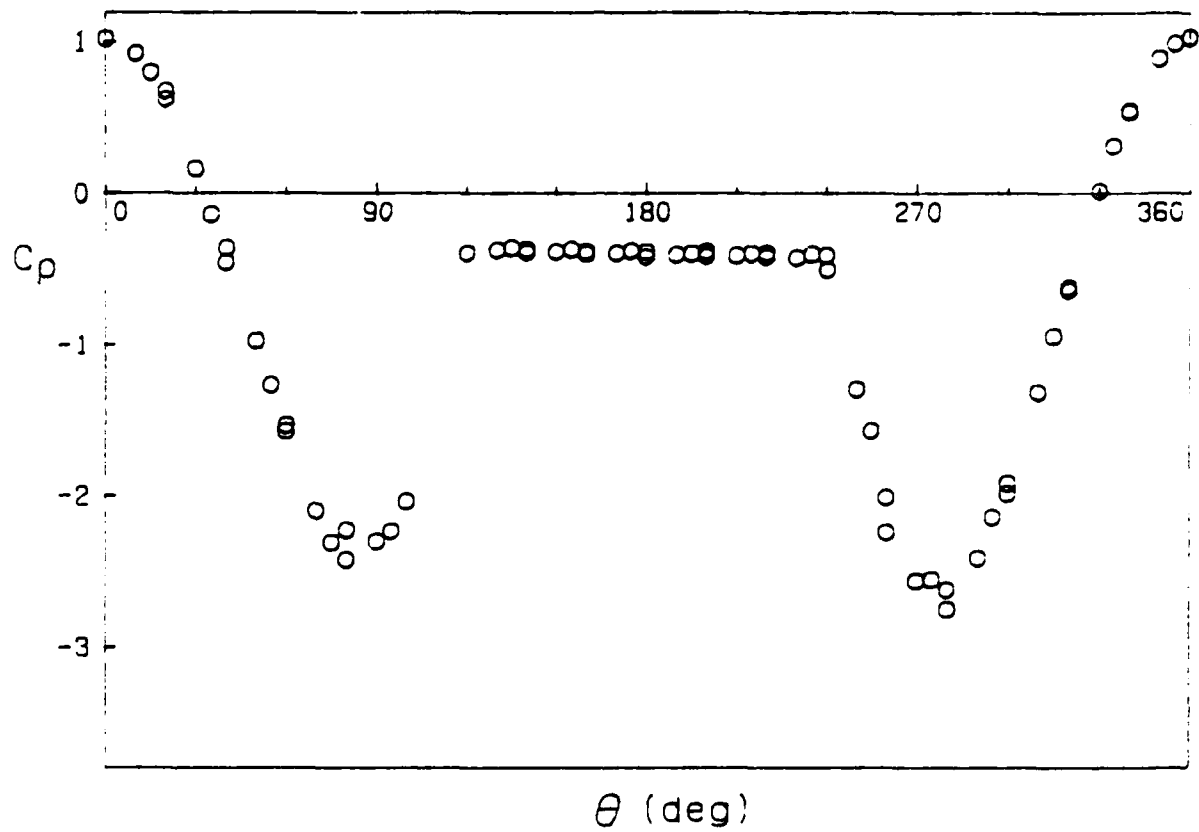
[SMOOTH CYLINDER]

Re= 2.050 ×10⁶   K/D= 0.0000   RUN ID= 98
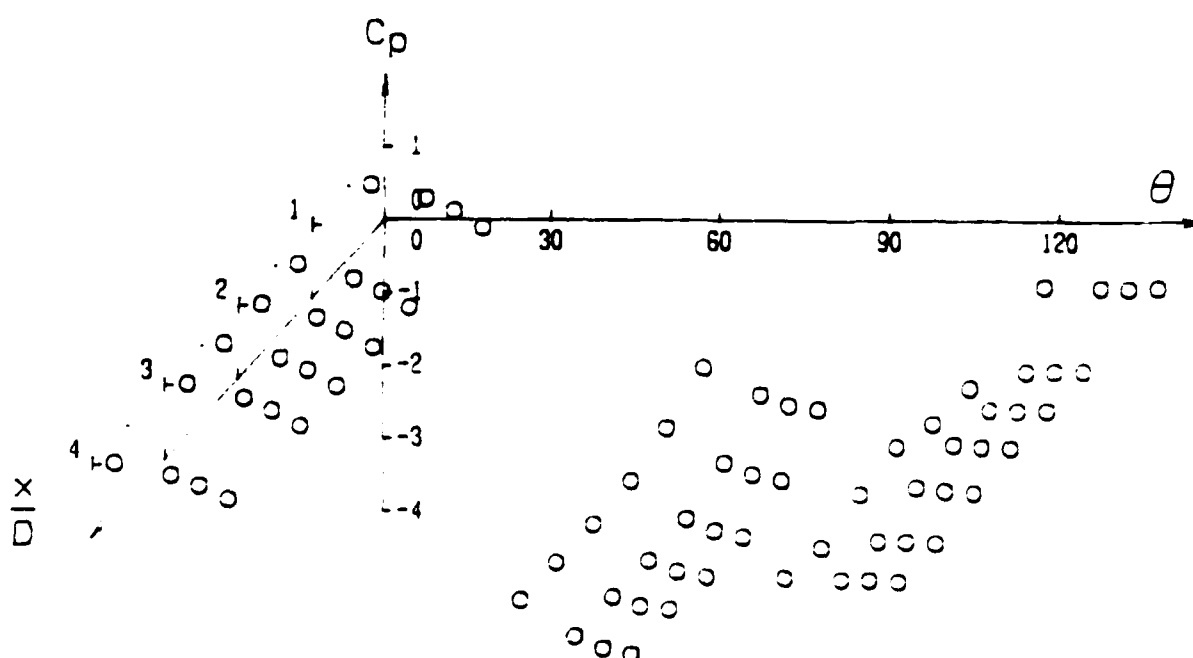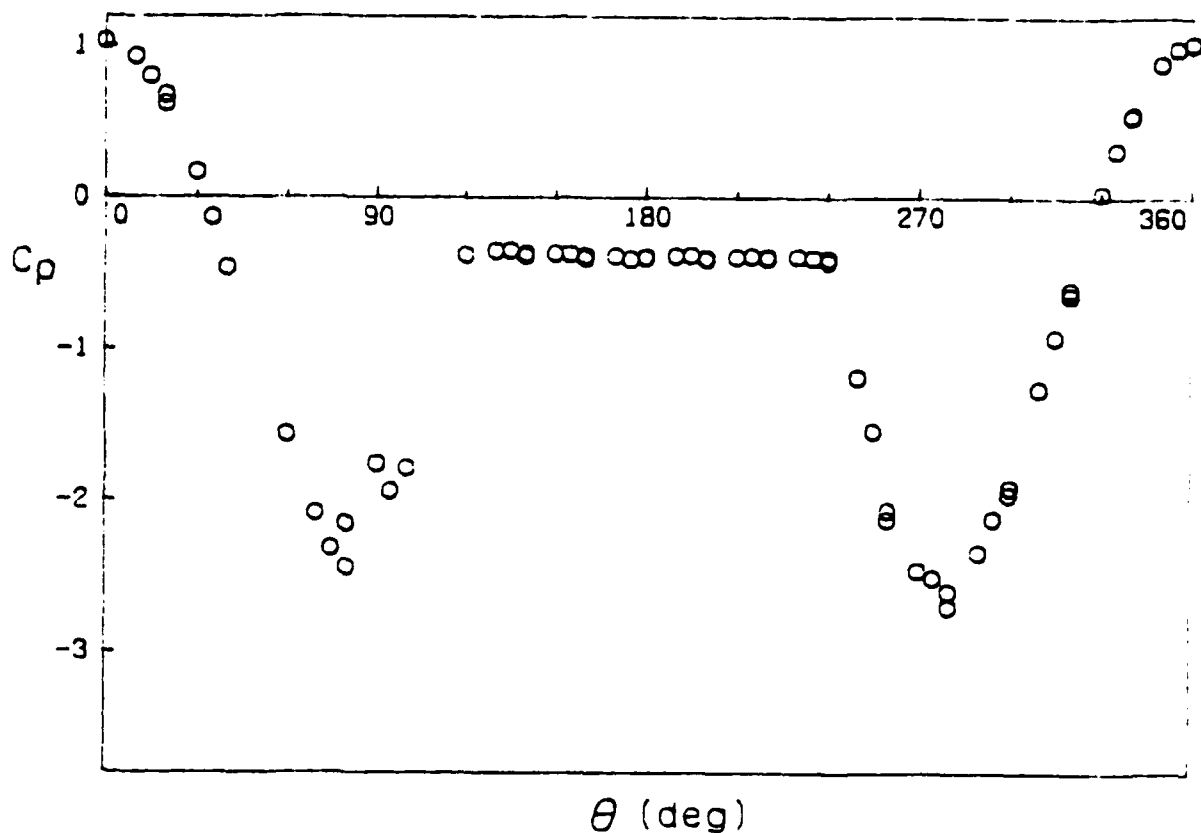
[SMOOTH CYLINDER]

Re= 2.979 x10⁶   k/D= 0.0000   RUN ID= 12

θ (deg)

I-43
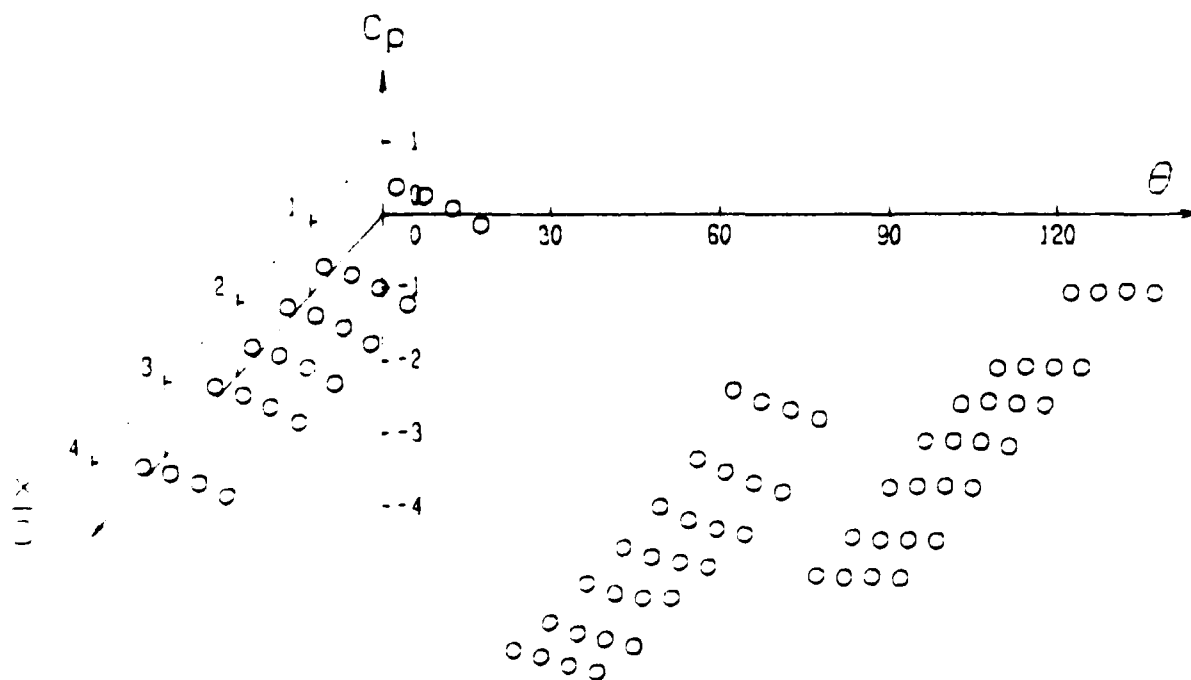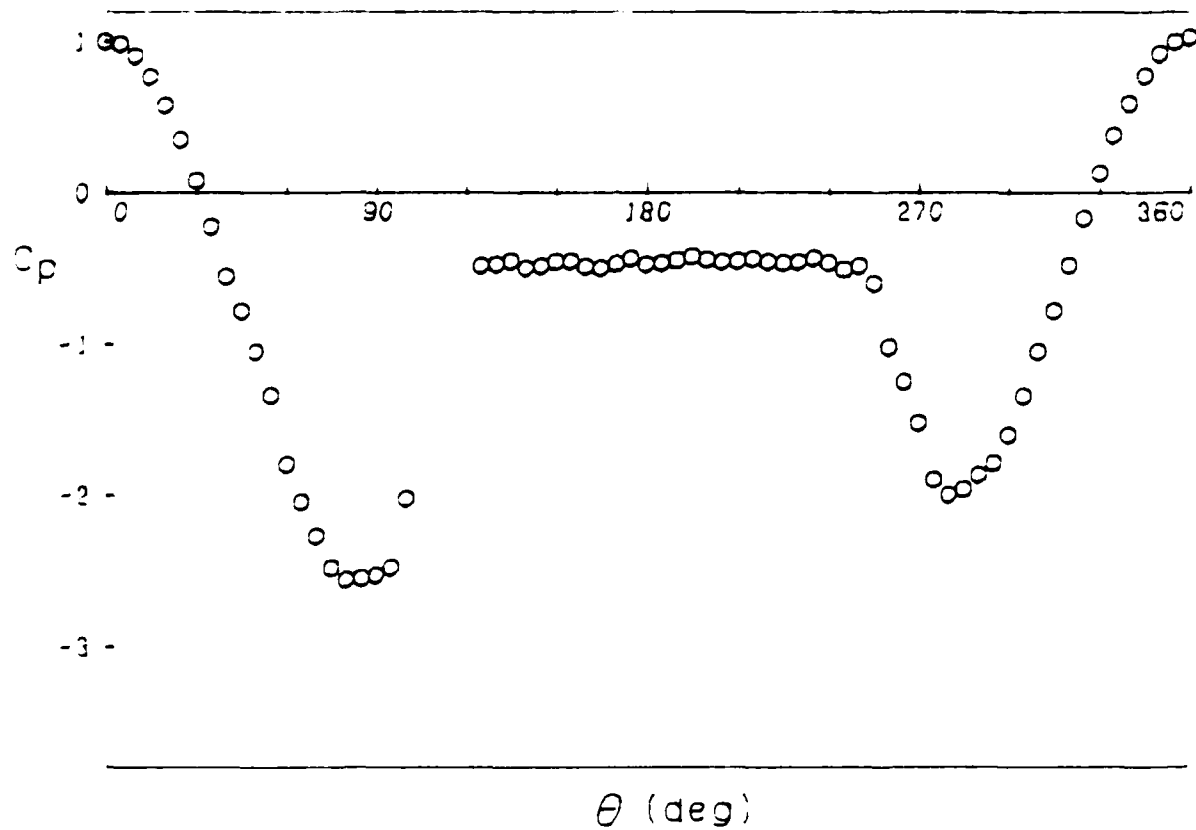
[SMOOTH CYLINDER]

Re= 3.064 ×10⁶   K/D= 0.0000   RUN ID= 96

θ (deg)
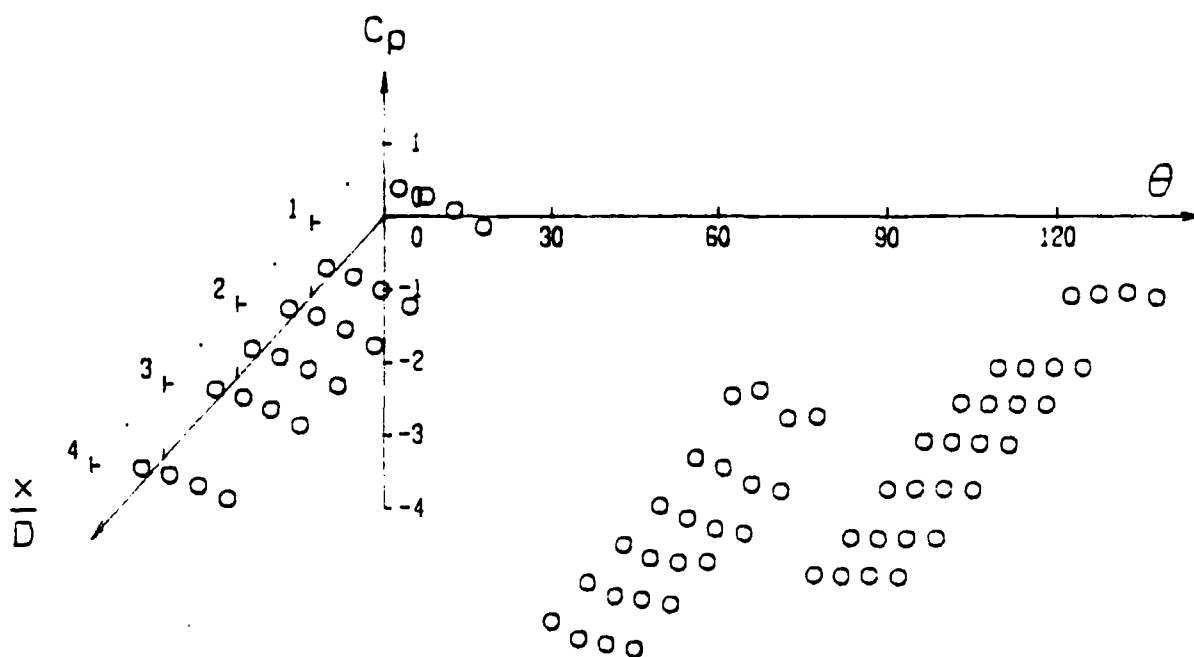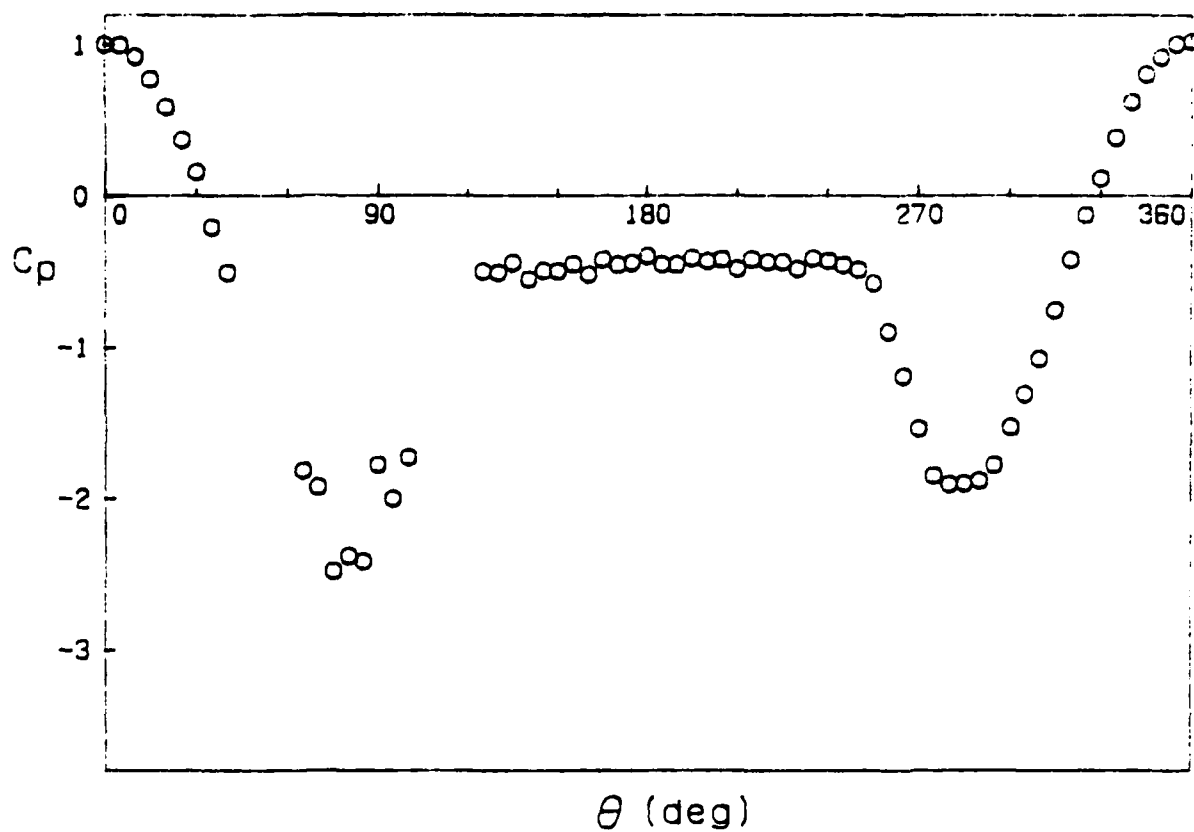
[SMOOTH CYLINDER]

Re= 3.934 x10⁶   k/D= 0.0000   RUN ID= 9
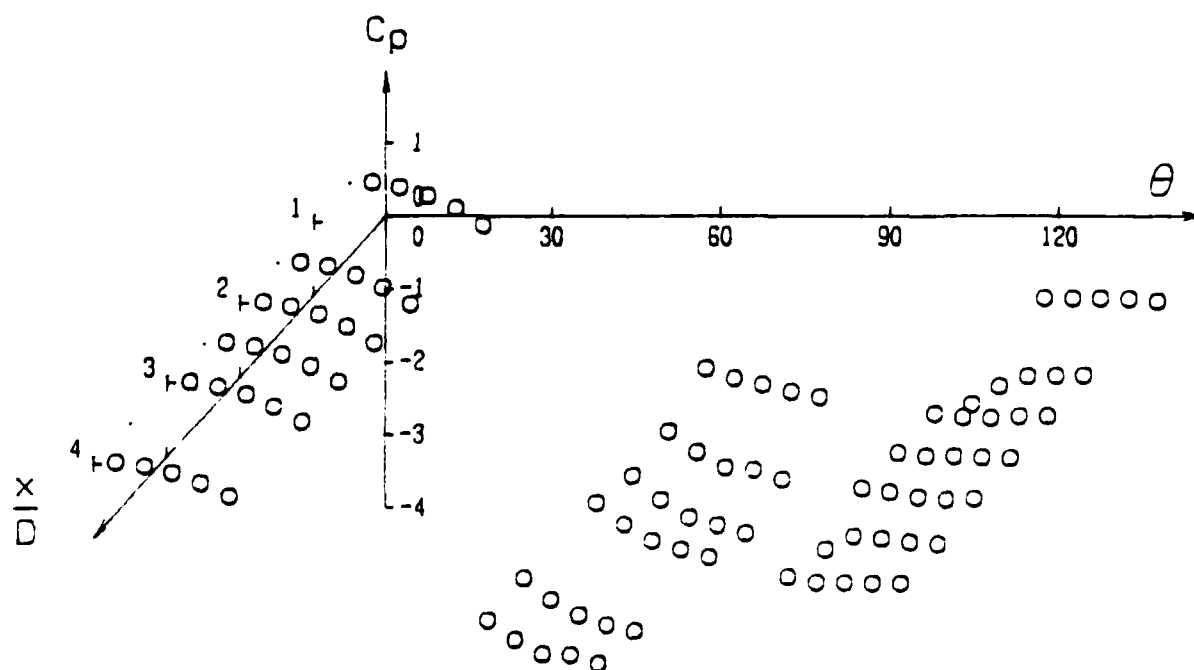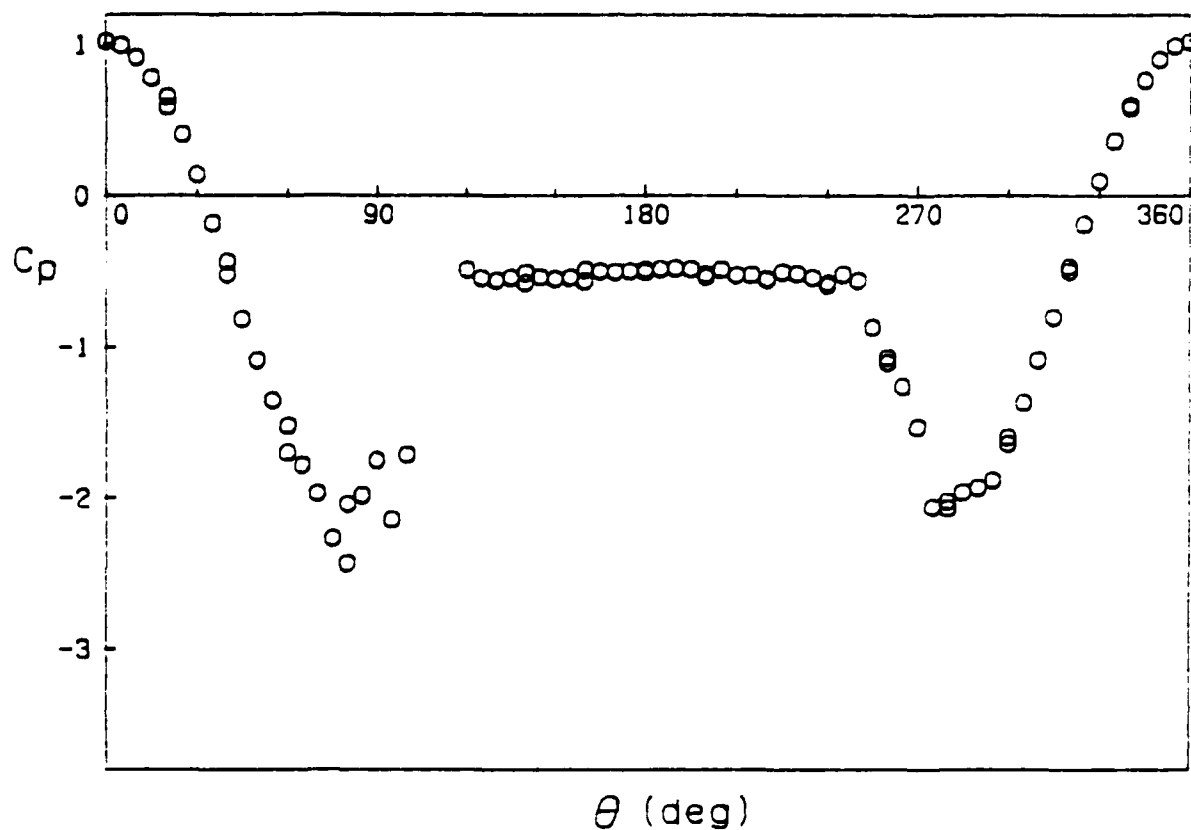
[SMOOTH CYLINDER]

Re= 4.129 ×10⁶   k/D= 0.0000   RUN ID= 95
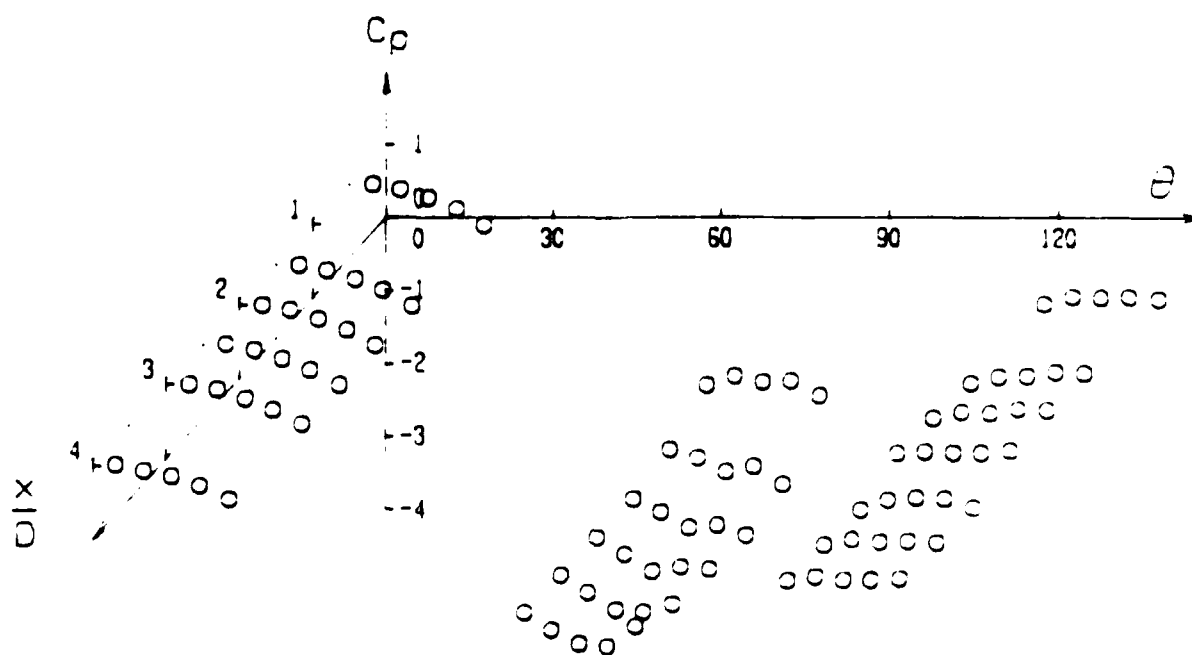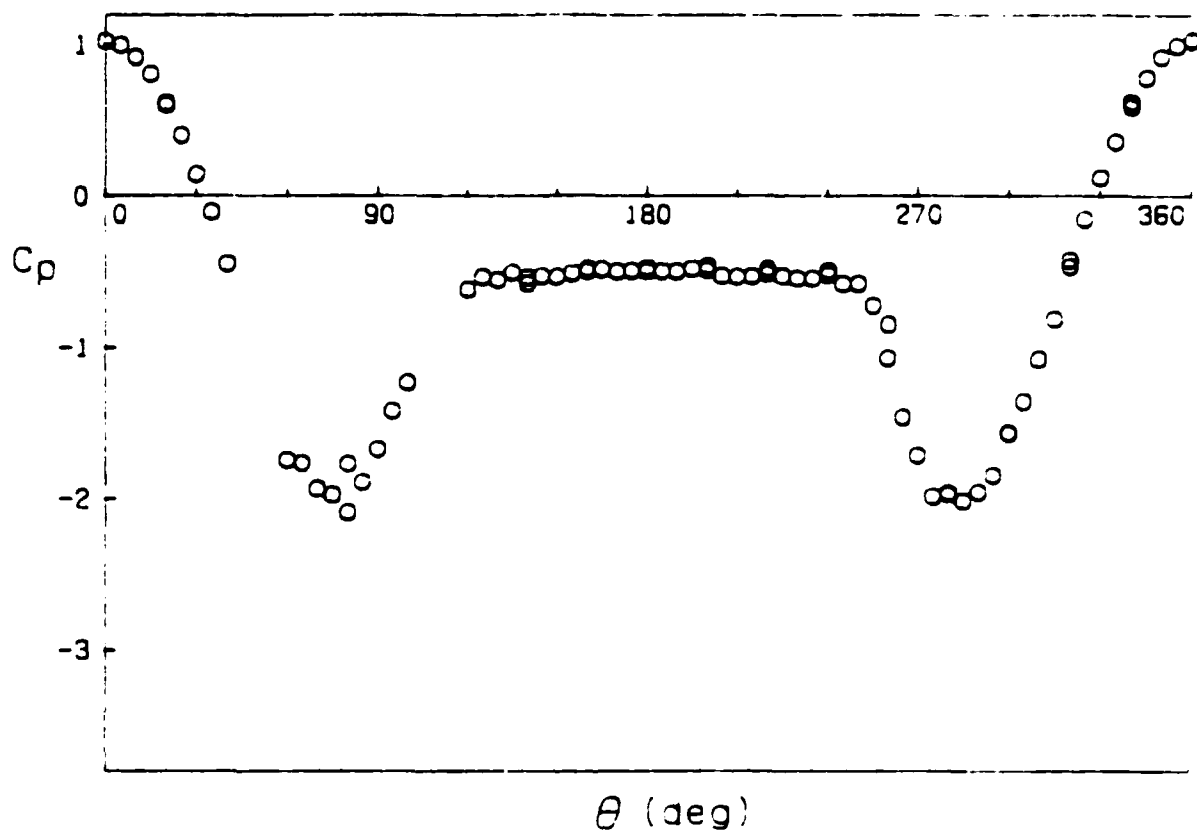
[SMOOTH CYLINDER]

Re= 4.929 ×10^6 k/D= 0.0000   RUN ID= 8

θ (deg)
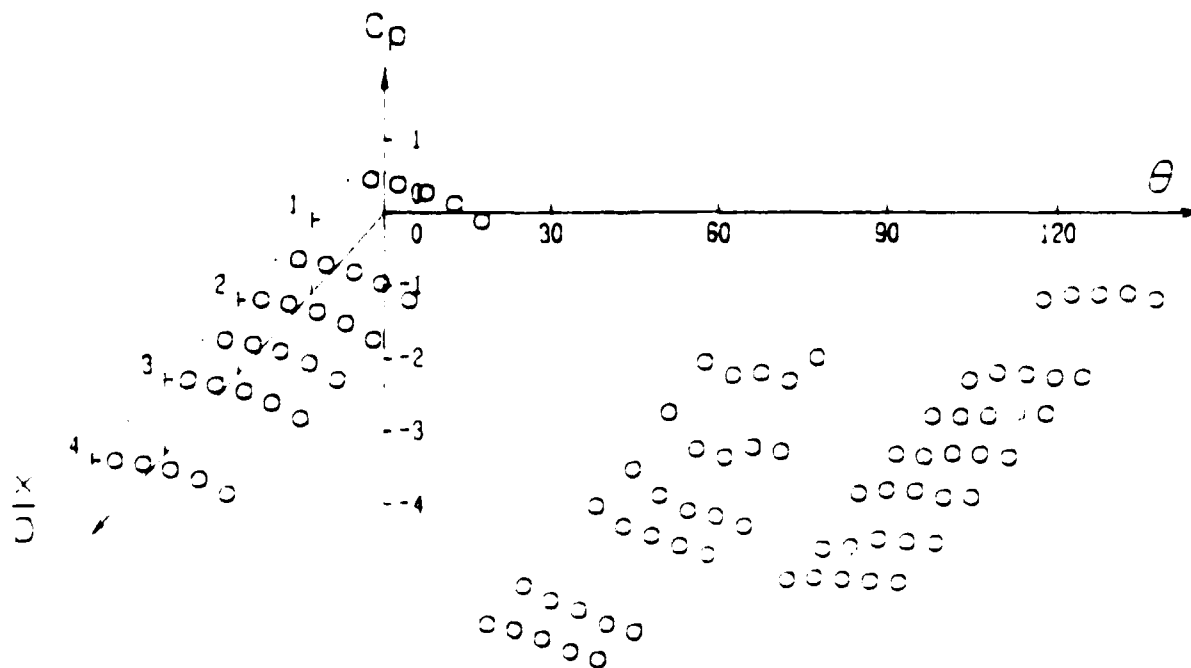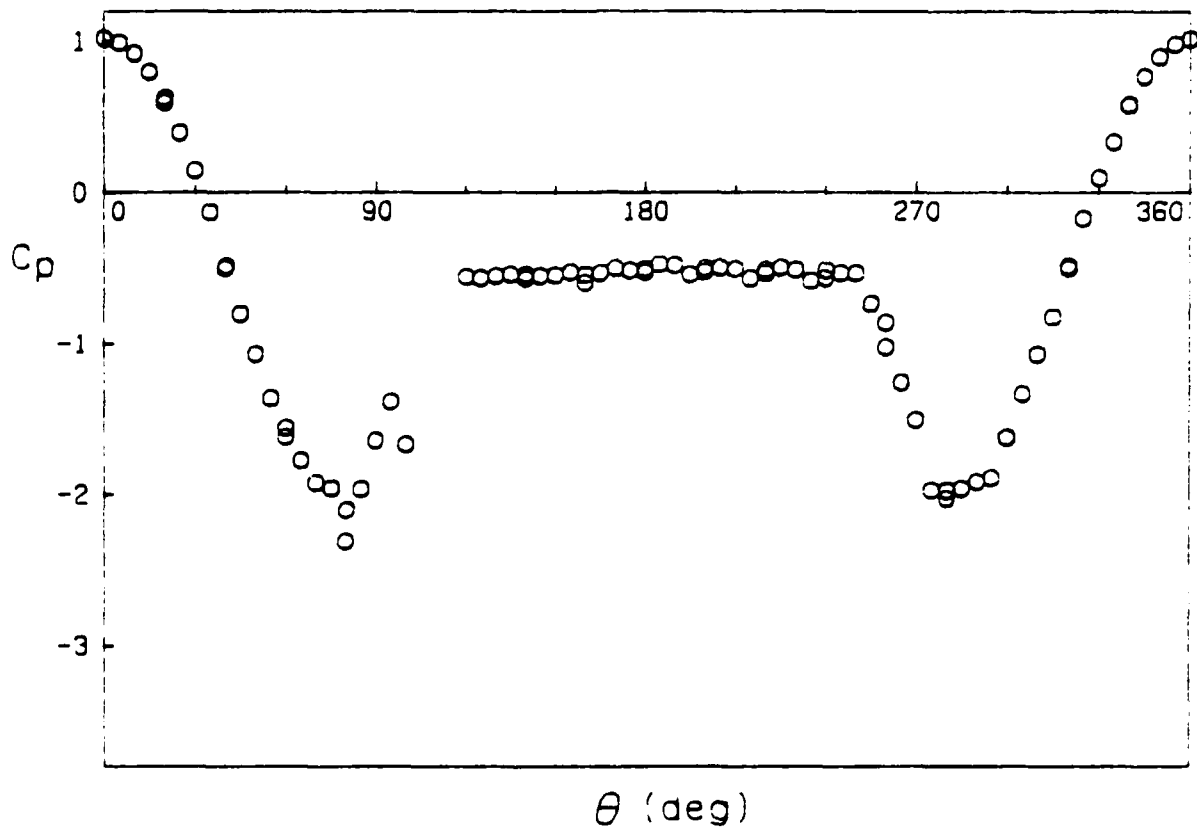
[SMOOTH CYLINDER]

Re= 5.098 x10⁶   K/D= 0.0000   RUN ID= 94
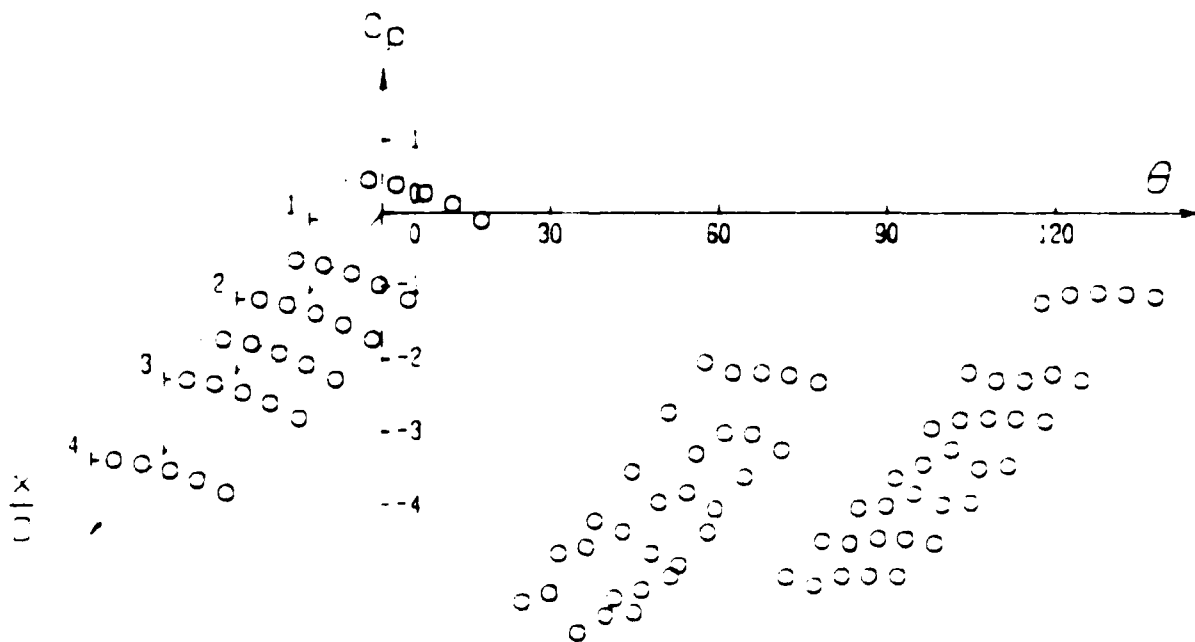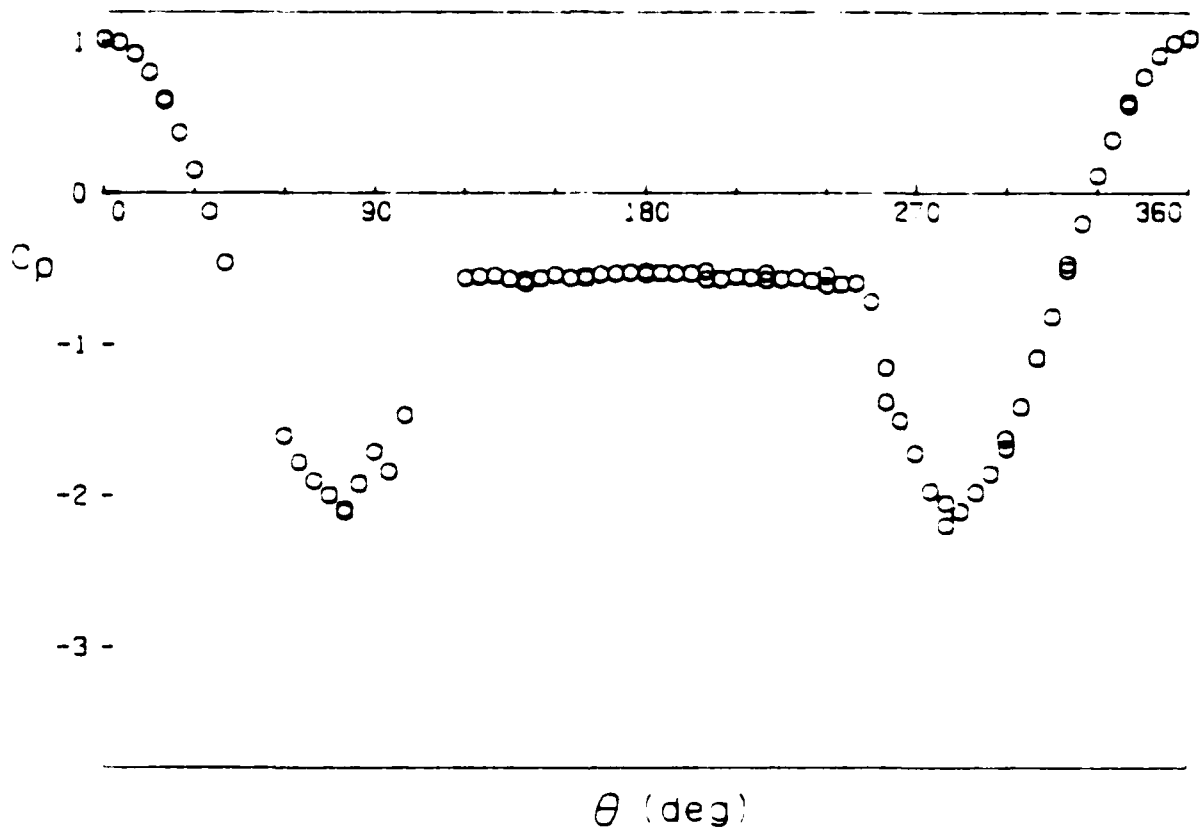
[SMOOTH CYLINDER]

Re= 5.907 x10⁶   K/C= 0.0000   RUN ID= 7

θ (deg)
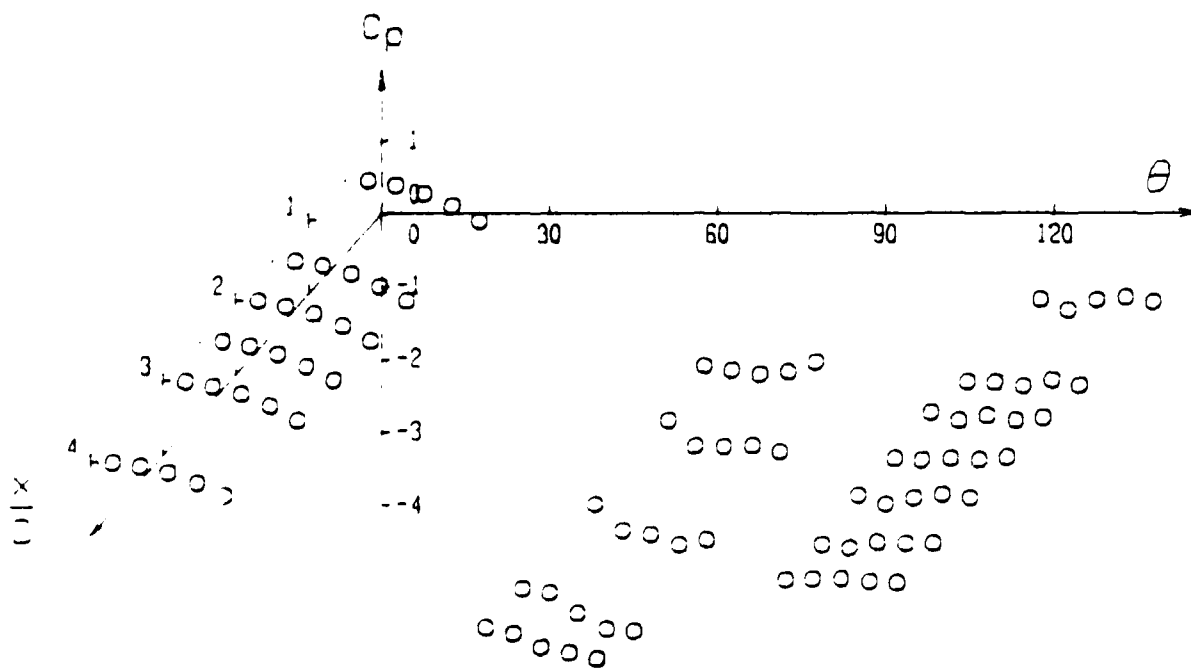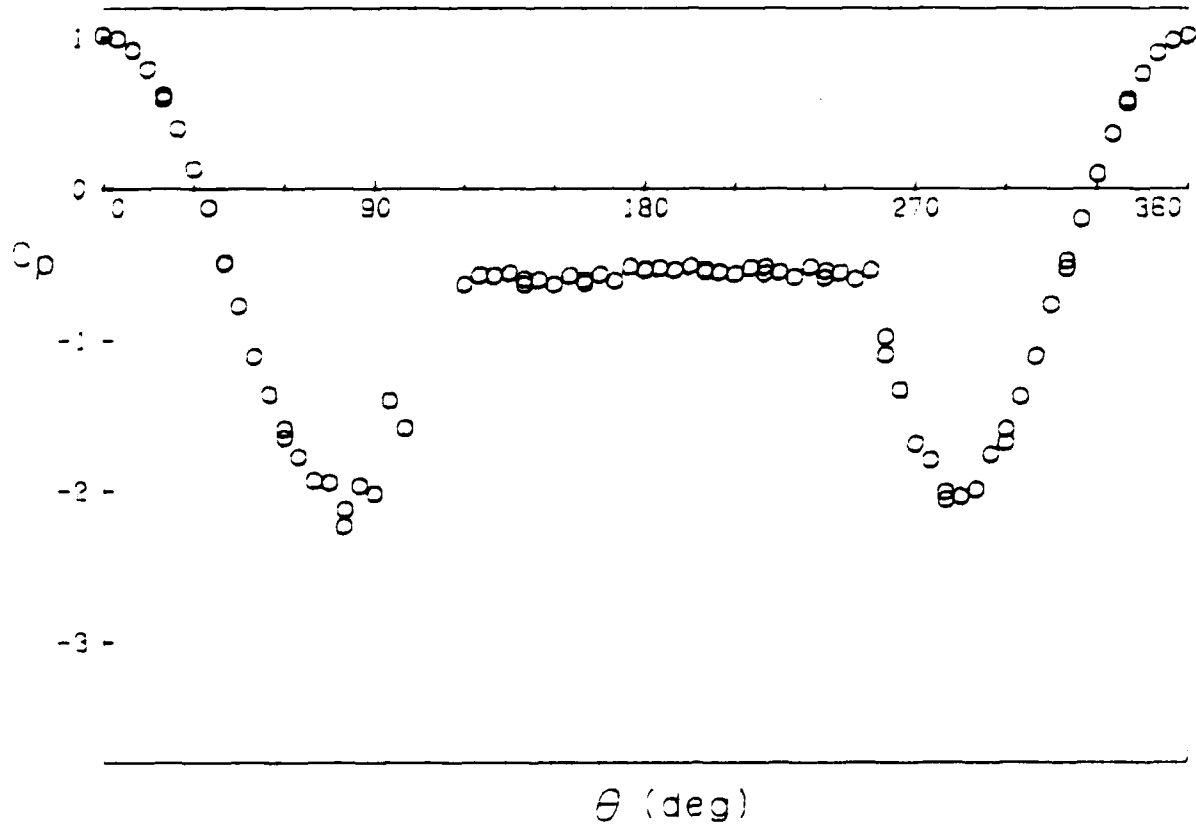
[SMOOTH CYLINDER]

Re= 6.128 $\times 10^6$ K/D= 0.0000   RUN ID= 93

I-50
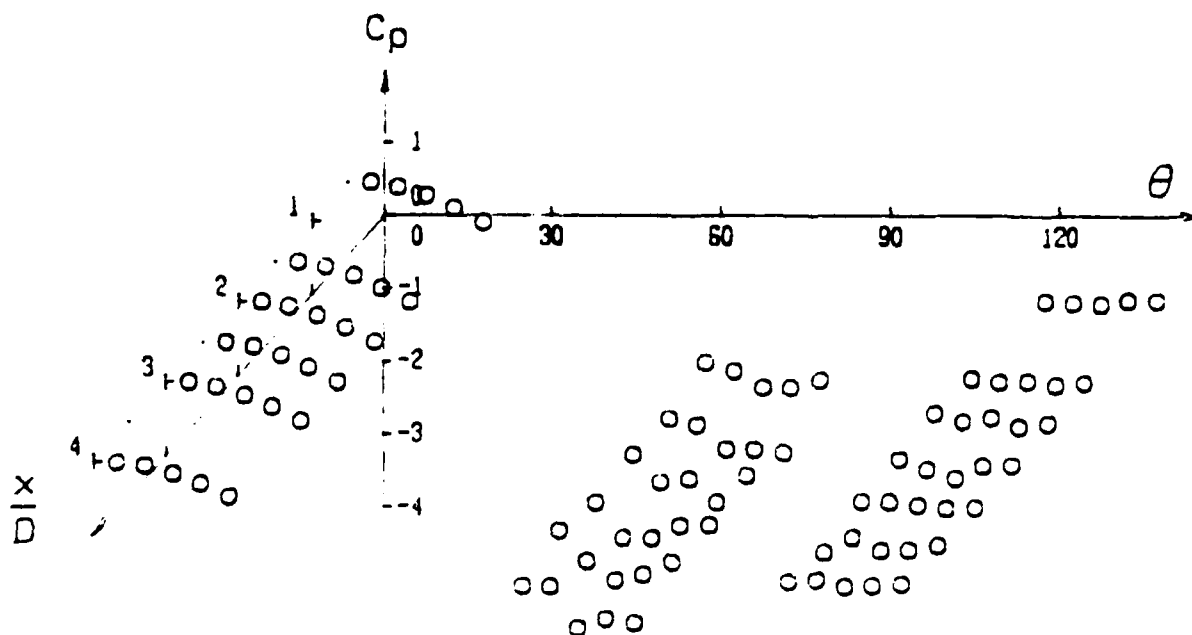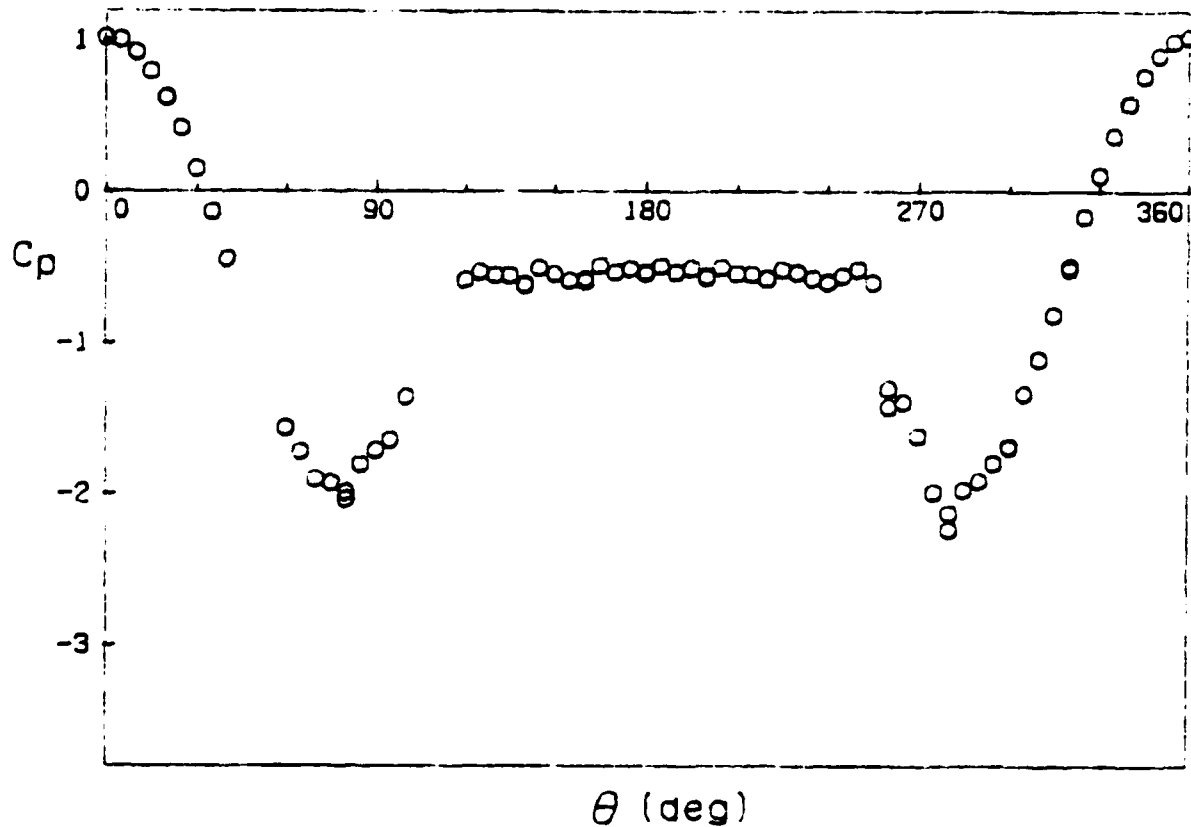
[SMOOTH CYLINDER]

Re= 6.798 ×10⁶   k/D= 0.0000   RUN ID= 6

θ (deg)
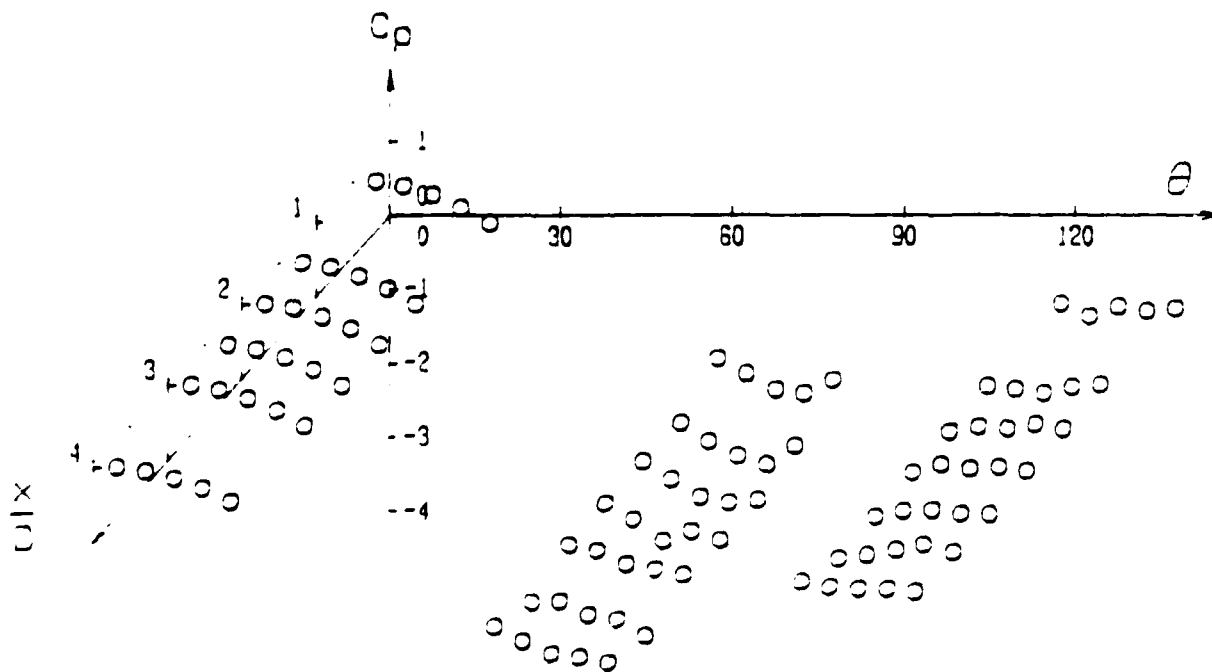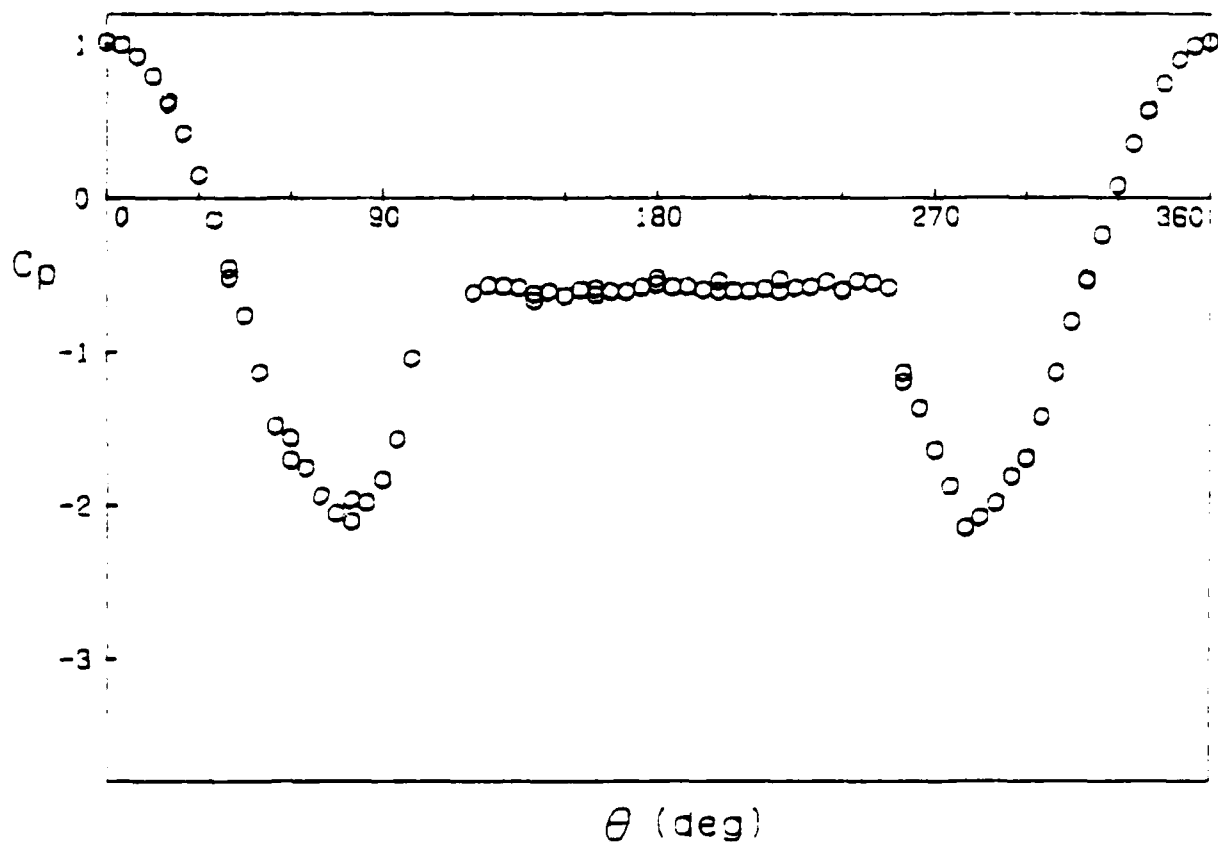
[SMOOTH CYLINDER]

Re= 7.146 ×10⁶   k/D= 0.0000   RUN ID= 92
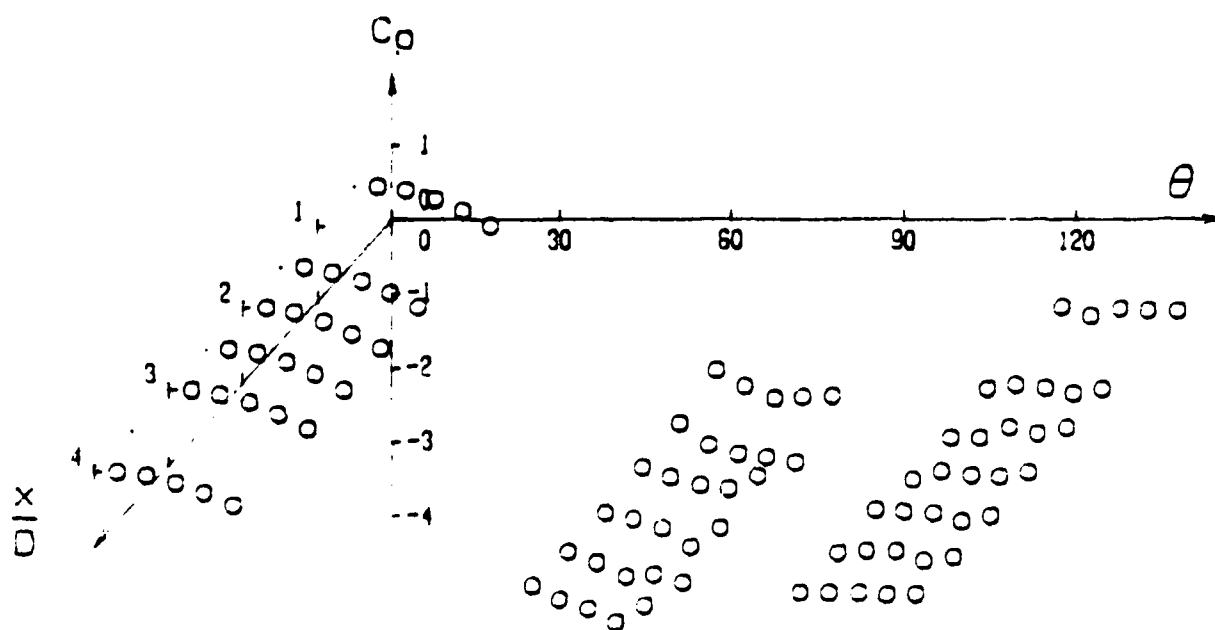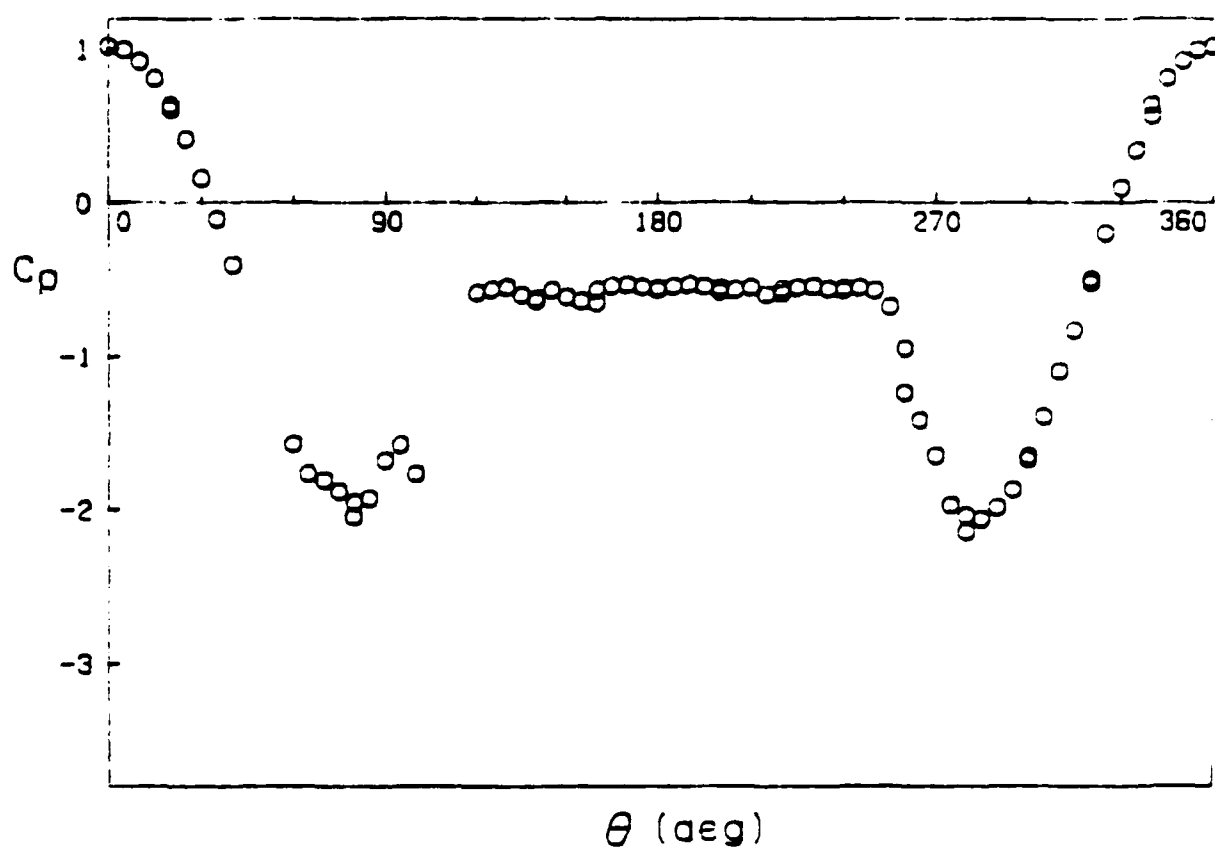
[SMOOTH CYLINDER]

Re= 7.780 x10⁶   K/D= 0.0000   RUN ID= 5

θ (deg)
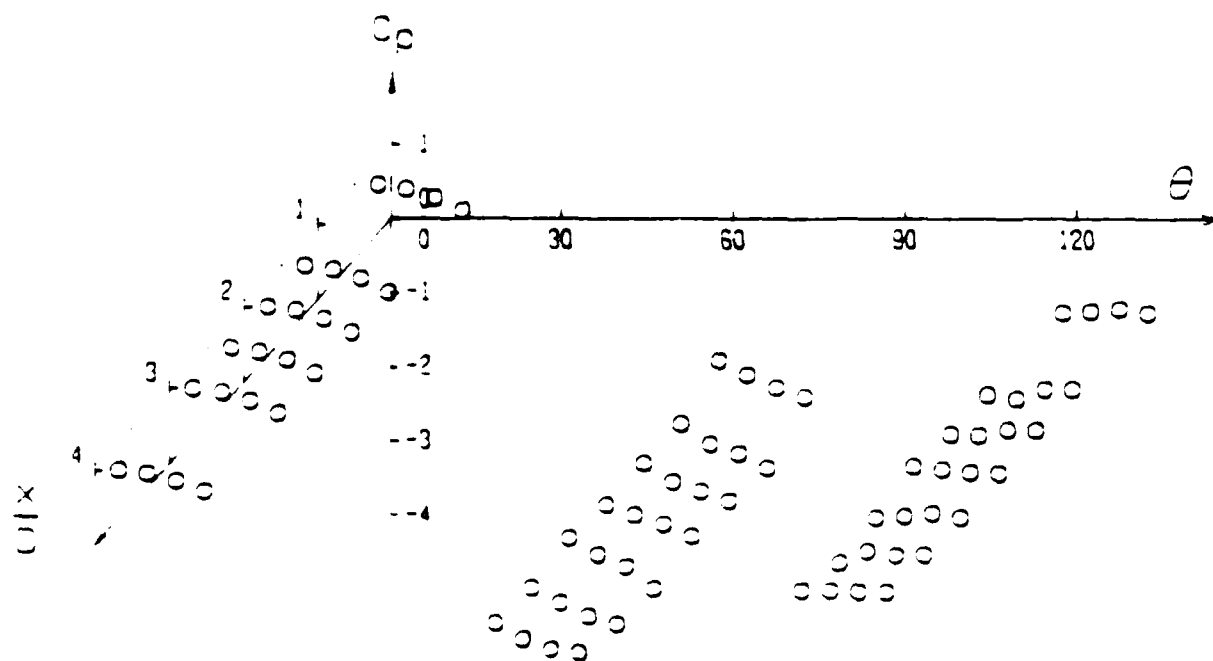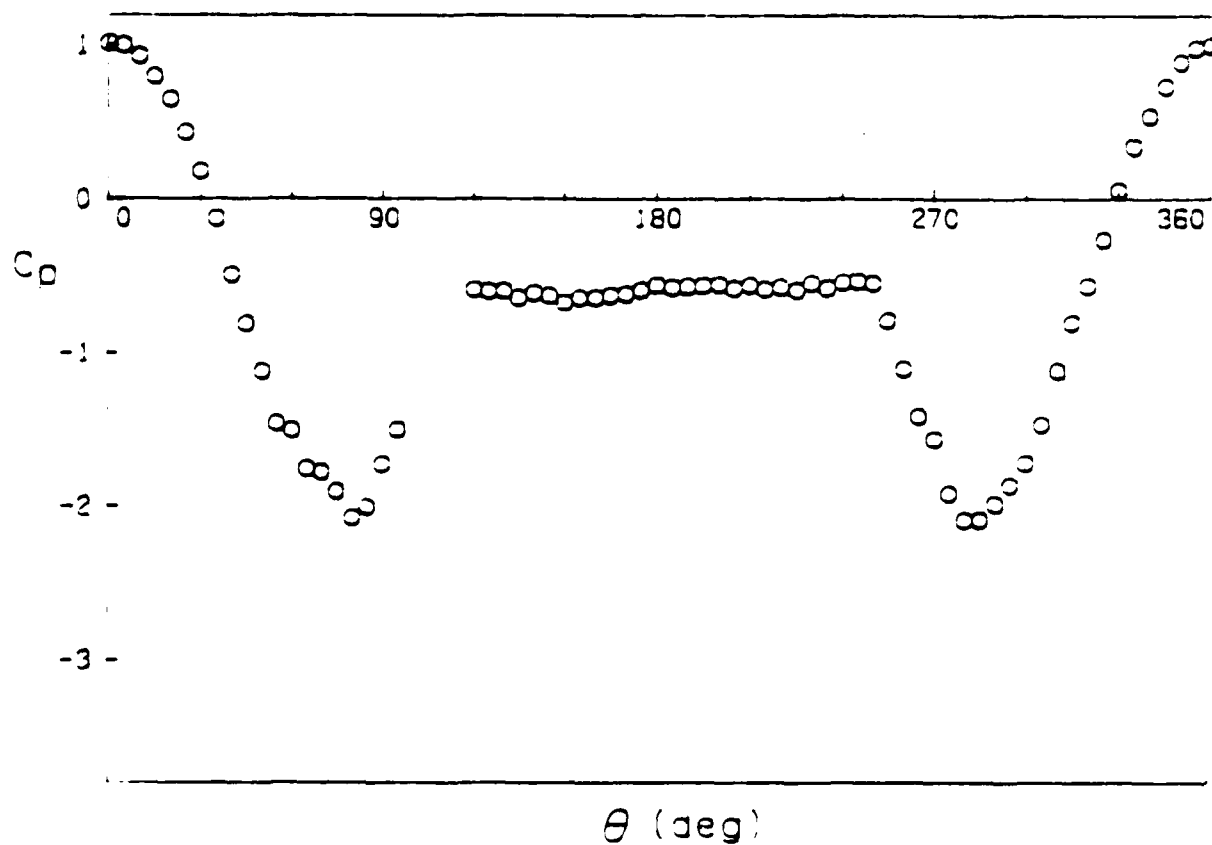
[SMOOTH CYLINDER]

Re= 8.064 ×10⁶   K/D= 0.0000   RUN ID= 91

θ (deg)
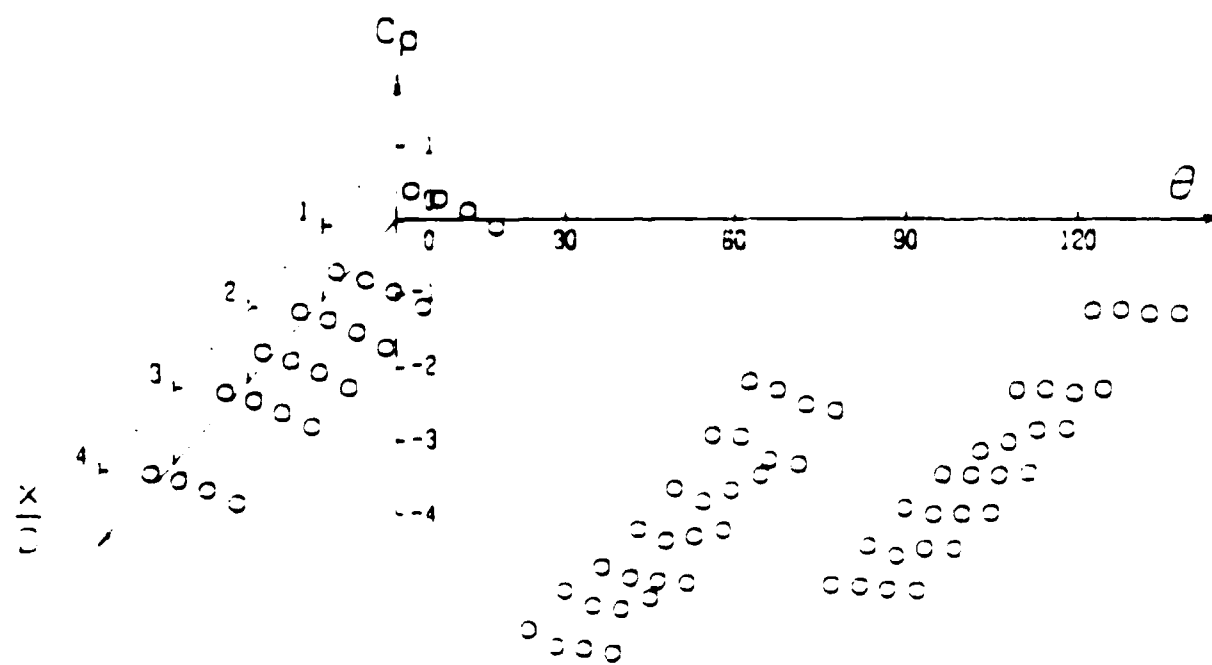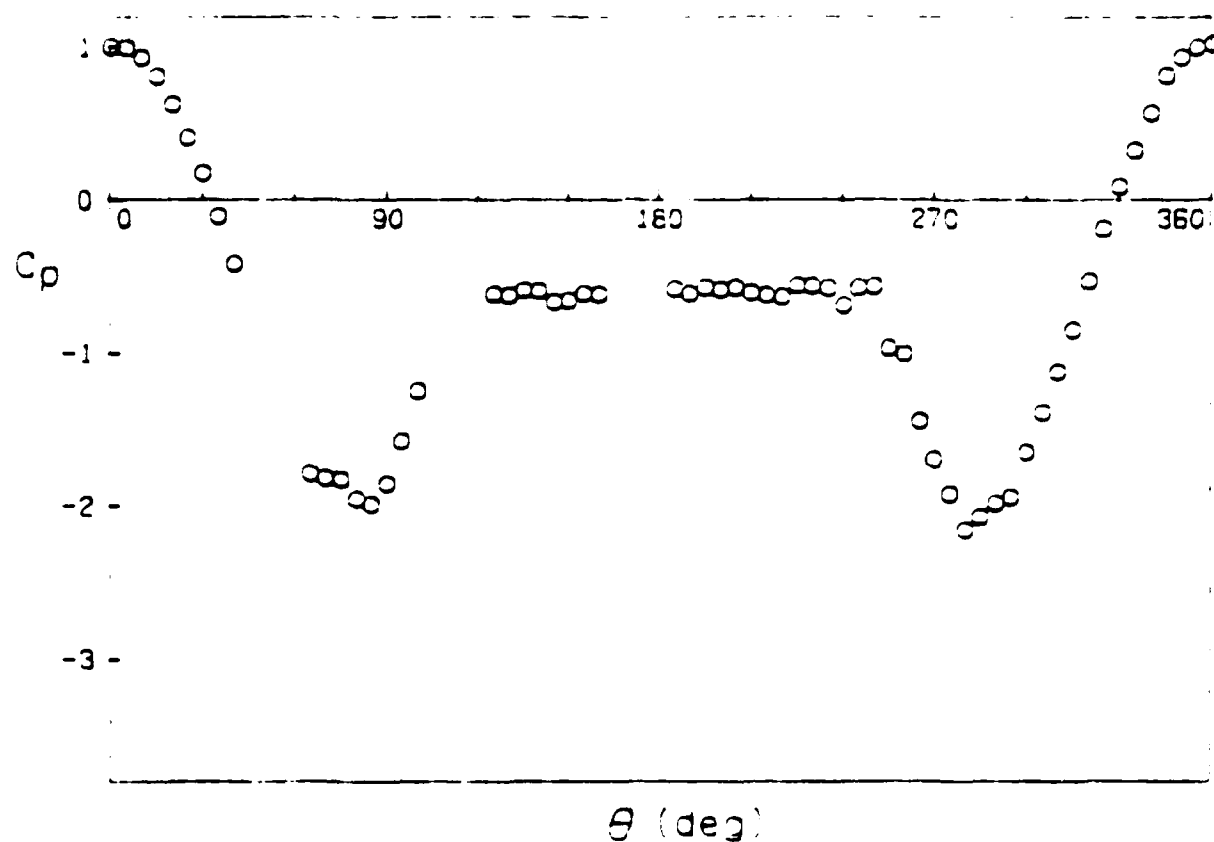
APPENDIX II

PRESSURE DISTRIBUTION PLOTS - CONF2 ROUGH CYLINDER (k/D=0.0003)

RUN ID	Re_D	Cd
188	0.42×10^6	0.513
189	0.51	0.572
192	0.65	0.664
193	0.72	0.690
194	0.82	0.679
195	0.92	0.690
196	1.03	0.690
210	1.20	0.573
198	1.27	0.688
199	1.53	0.685
211	1.81	0.697
200	2.08	0.815
201	2.57	0.871
208	2.89	0.782
212	2.98	0.782
202	3.11	0.899
213	3.56	0.820
203	4.11	0.895
214	4.41	0.330
204	5.14	0.897
215	5.21	0.354
205	6.19	0.379
206	7.01	0.837

II

[ROUGH CYLINDER]

Re= 0.421 x10⁸   K/D= 0.0003   RUN ID= 188

θ (deg)

II-I
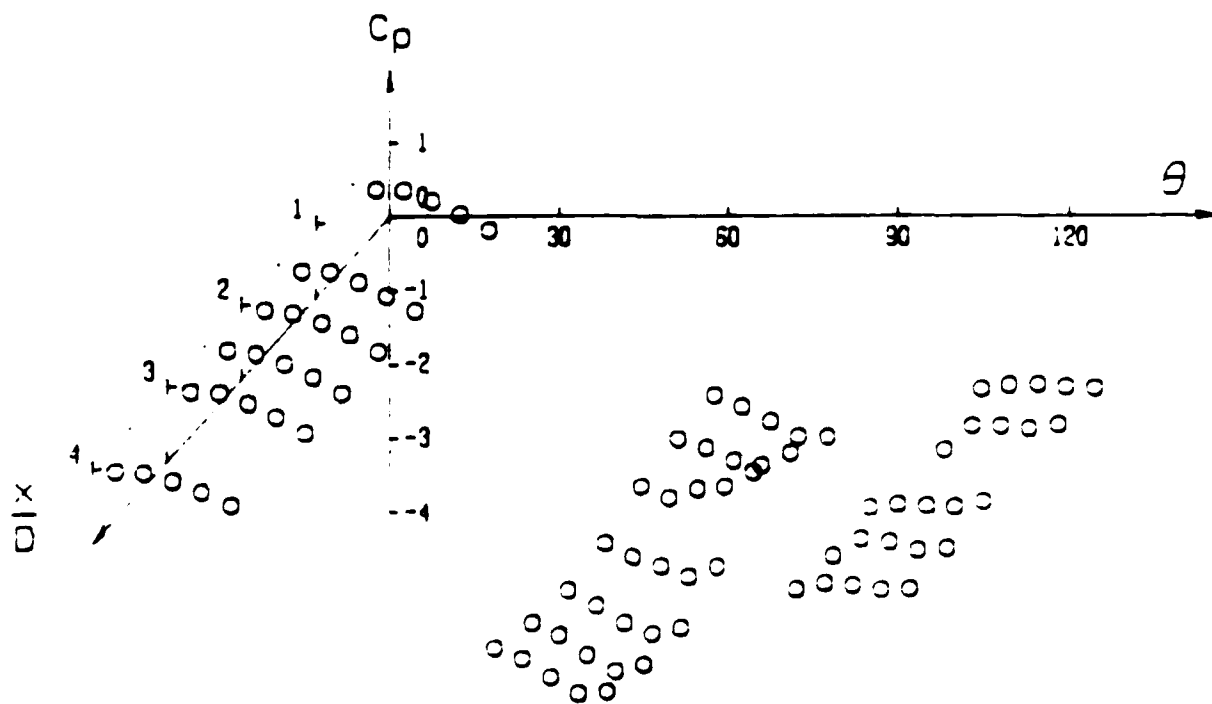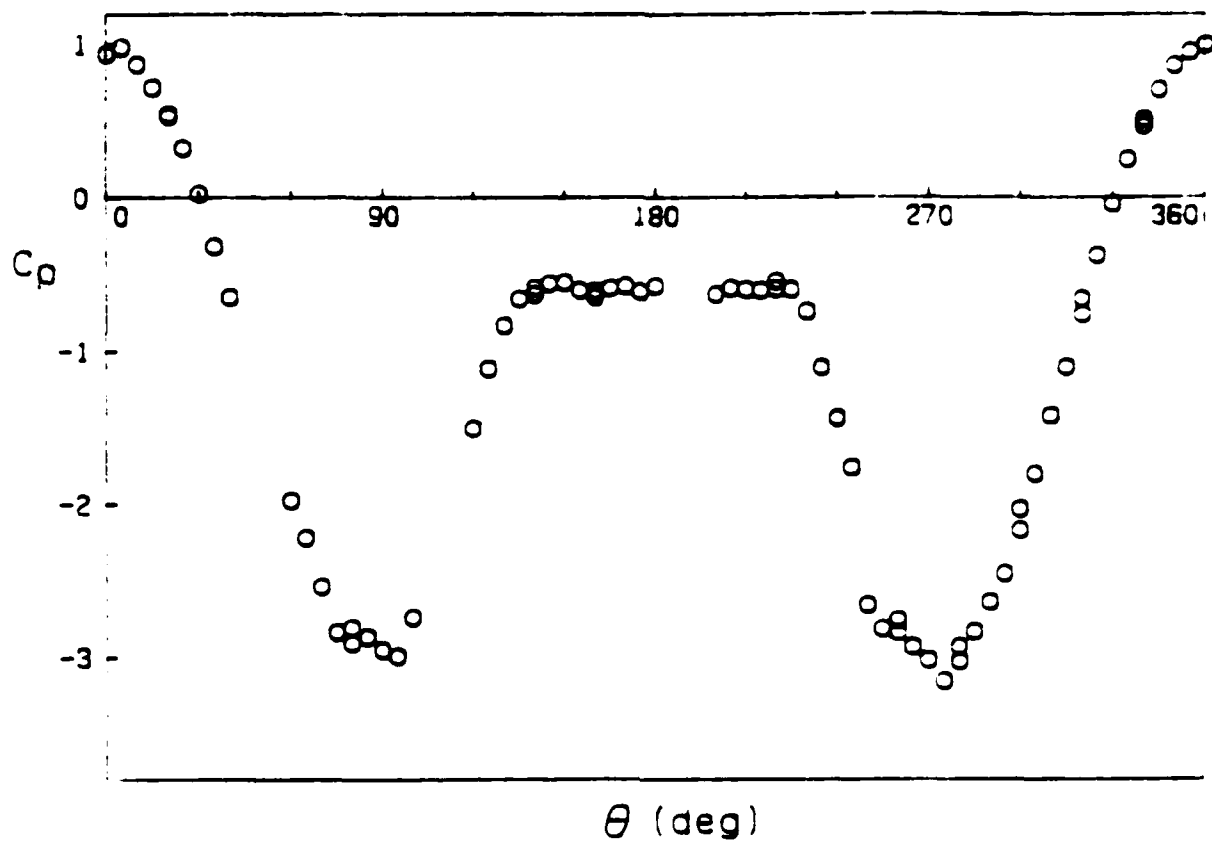
[ROUGH CYLINDER]

Re= 0.509 ×10⁶   κ/D= 0.0003   RUN ID= 189

θ (deg)

II-2
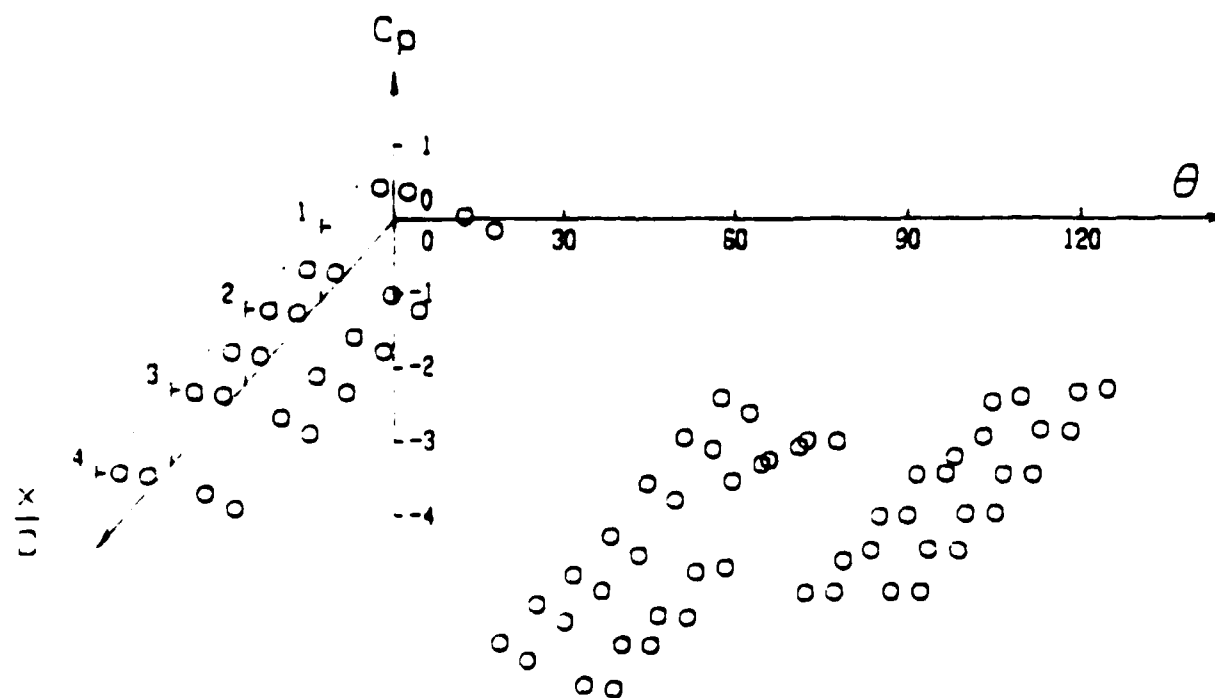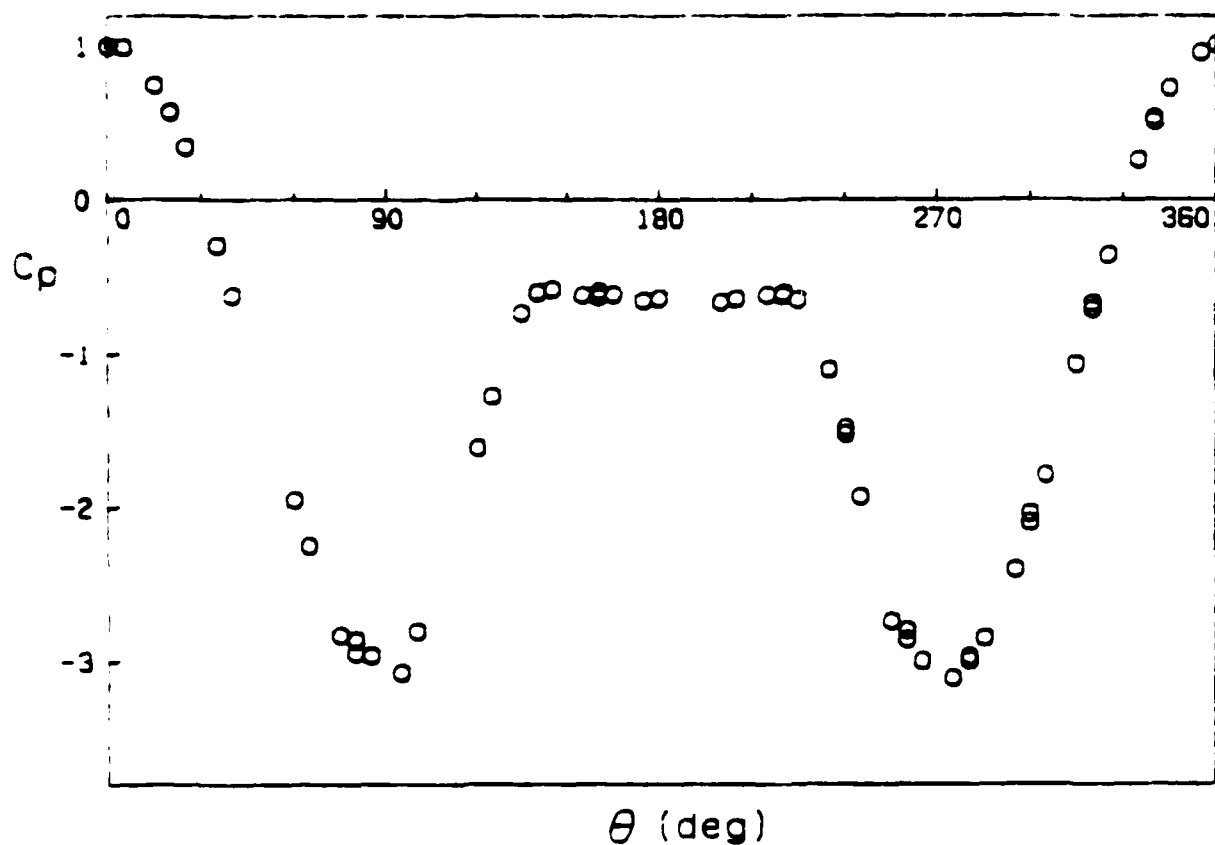
[ROUGH CYLINDER]

Re= 0.647 ×10⁶   K/D= 0.0003   RUN ID= 192

θ (deg)
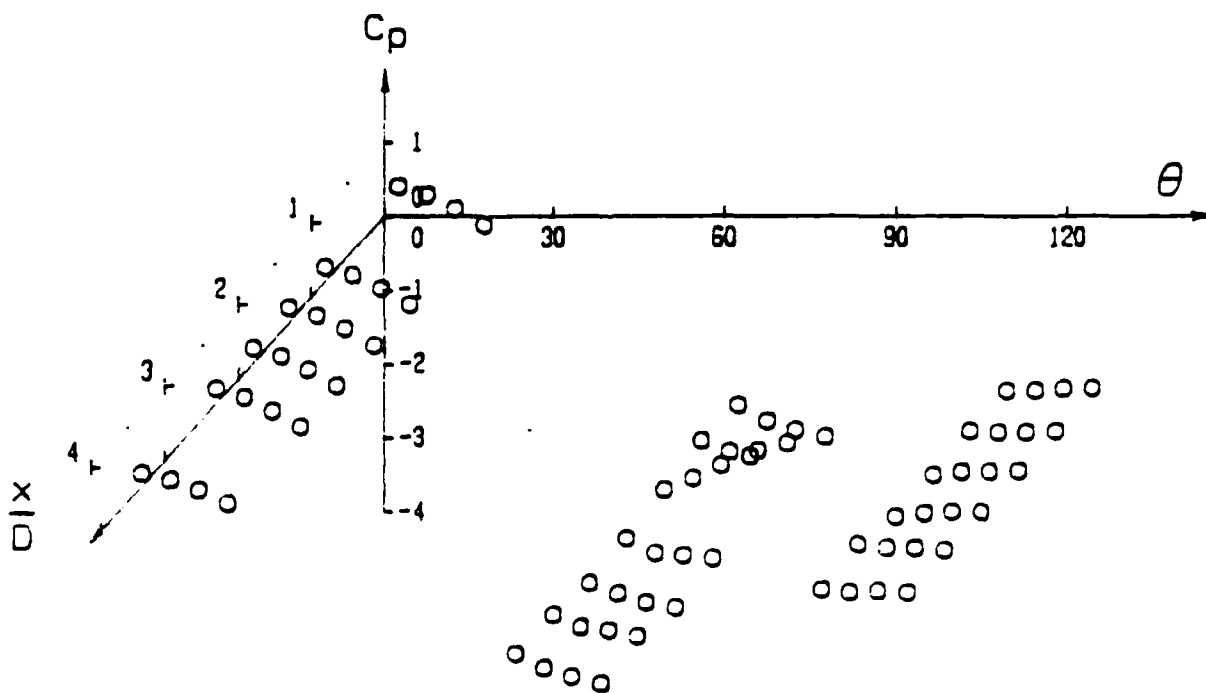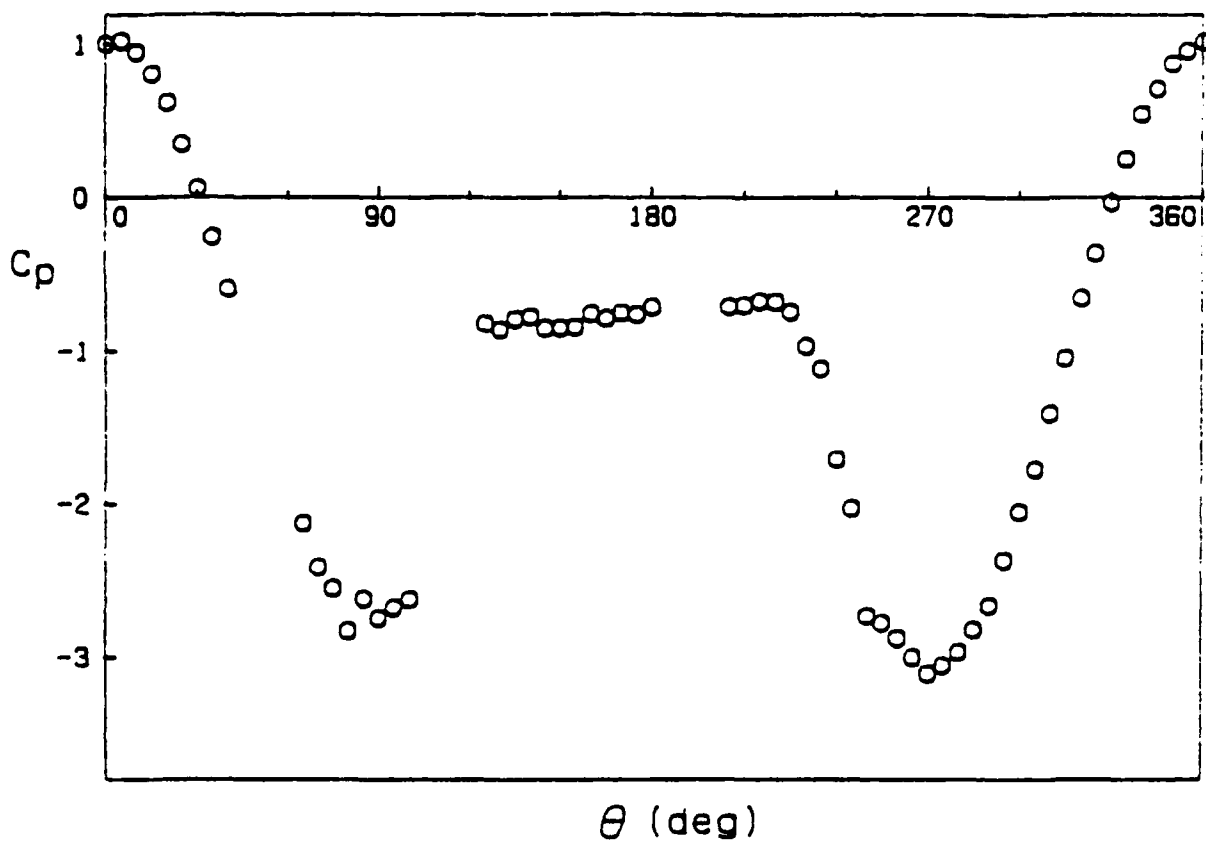
[ROUGH CYLINDER]

Re= 0.721 ×10^6 k/D= 0.0003   RUN ID= 193

θ (deg)

II-4
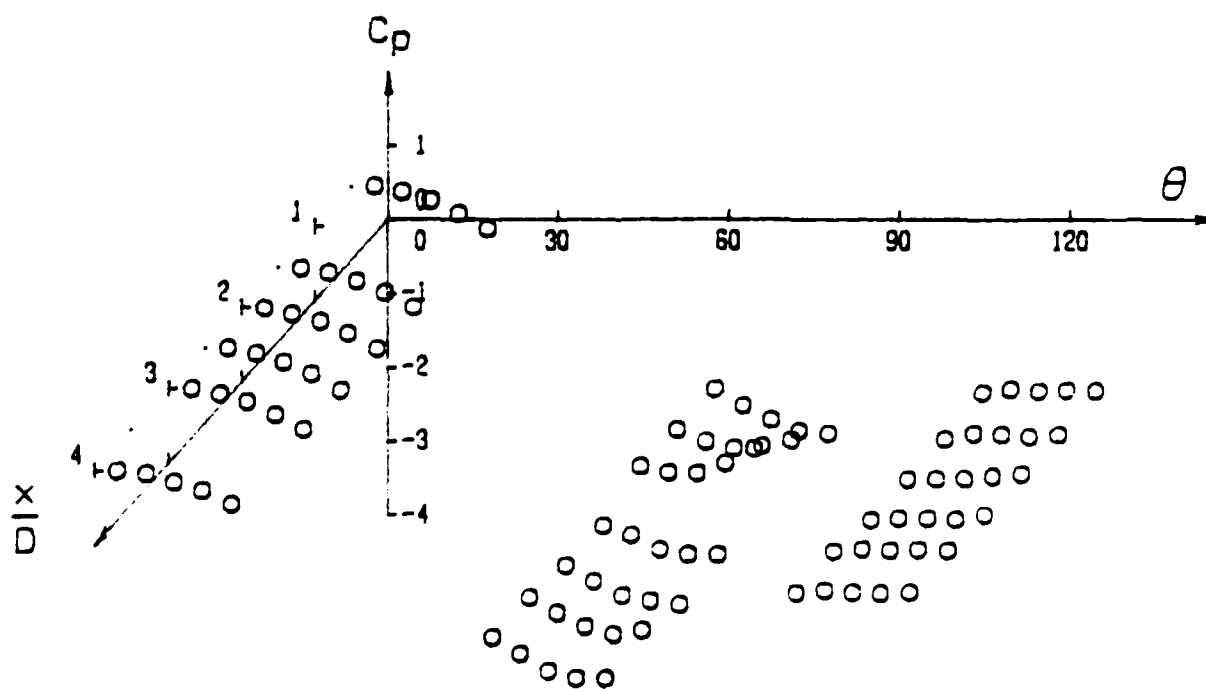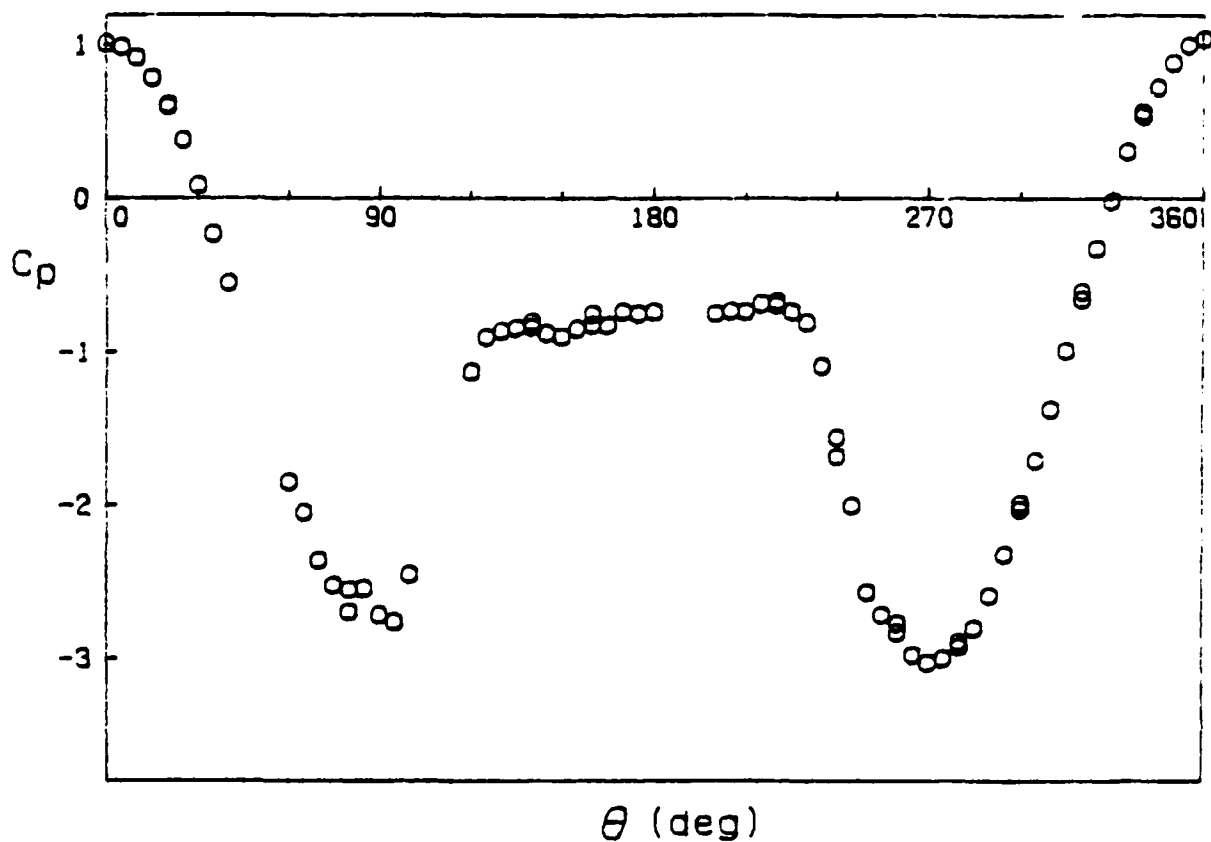
[ROUGH CYLINDER]

Re= 0.823 ×10^6 k/D= 0.0003   RUN ID= 194

θ (deg)

II-5
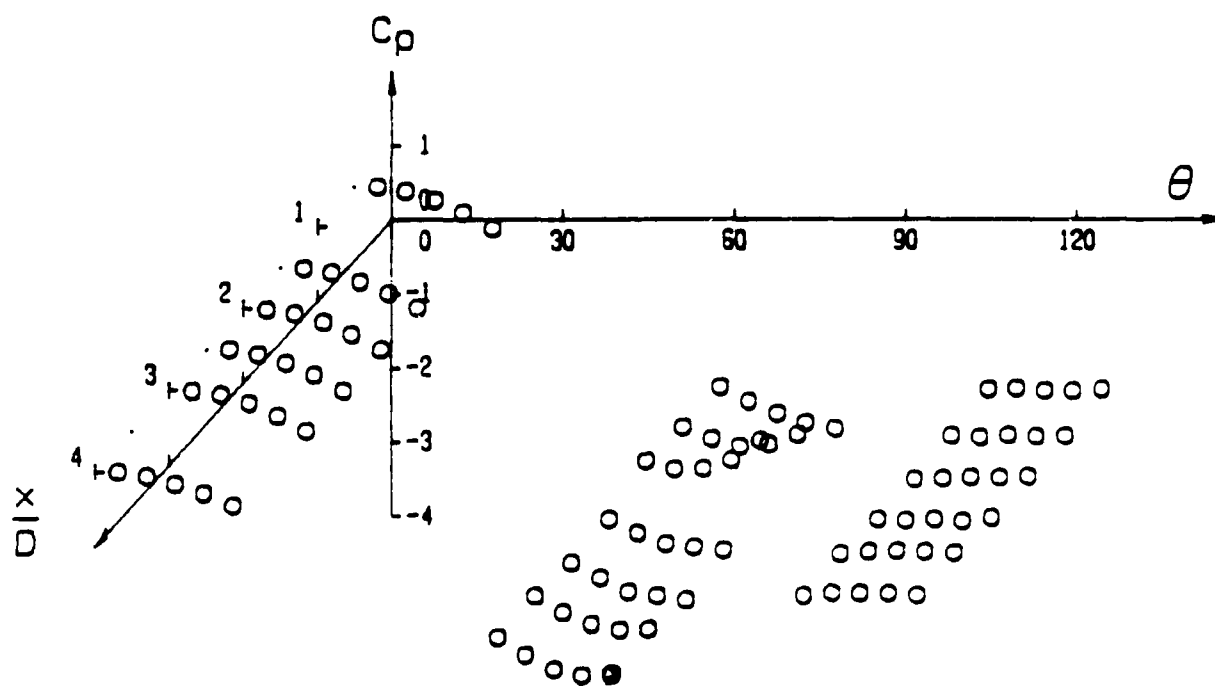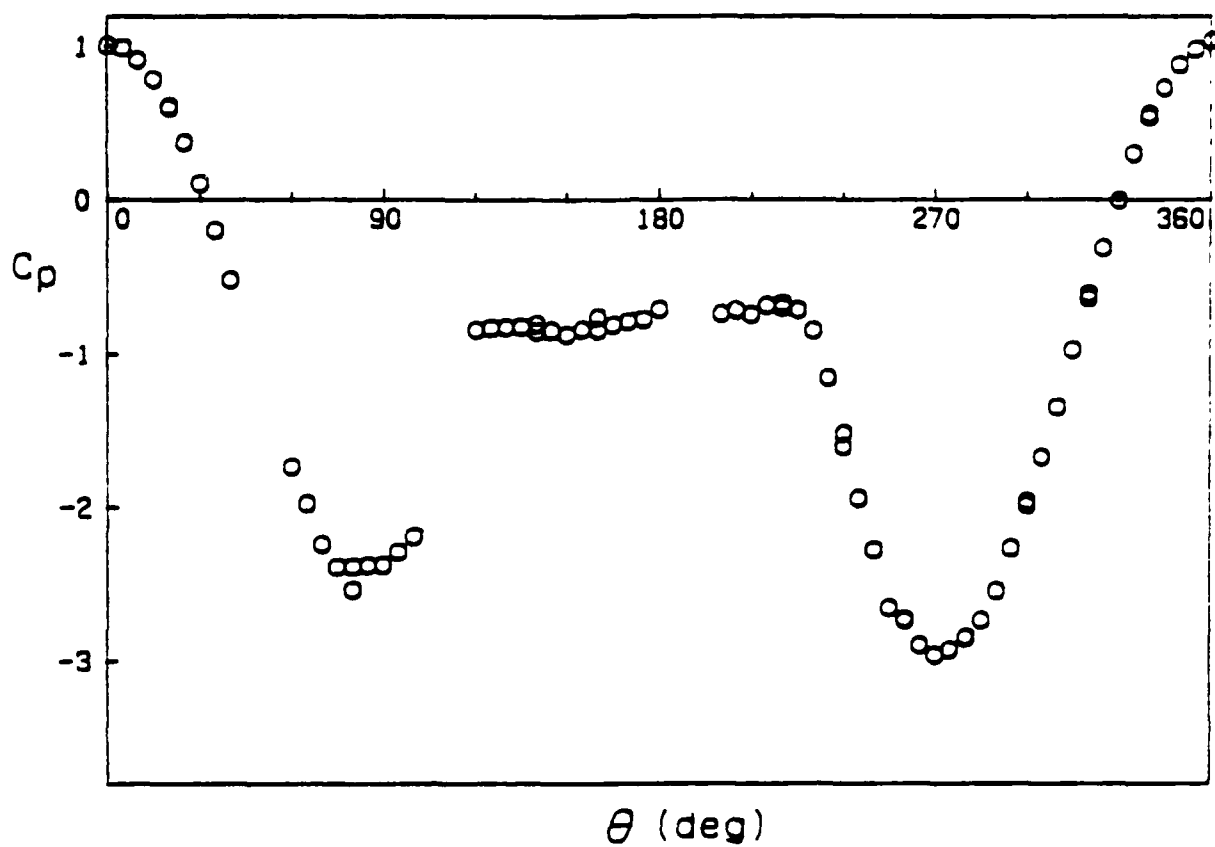
[ROUGH CYLINDER]

Re= 0.923 ×10⁶   K/D= 0.0003   RUN ID= 195

θ (deg)

II-b
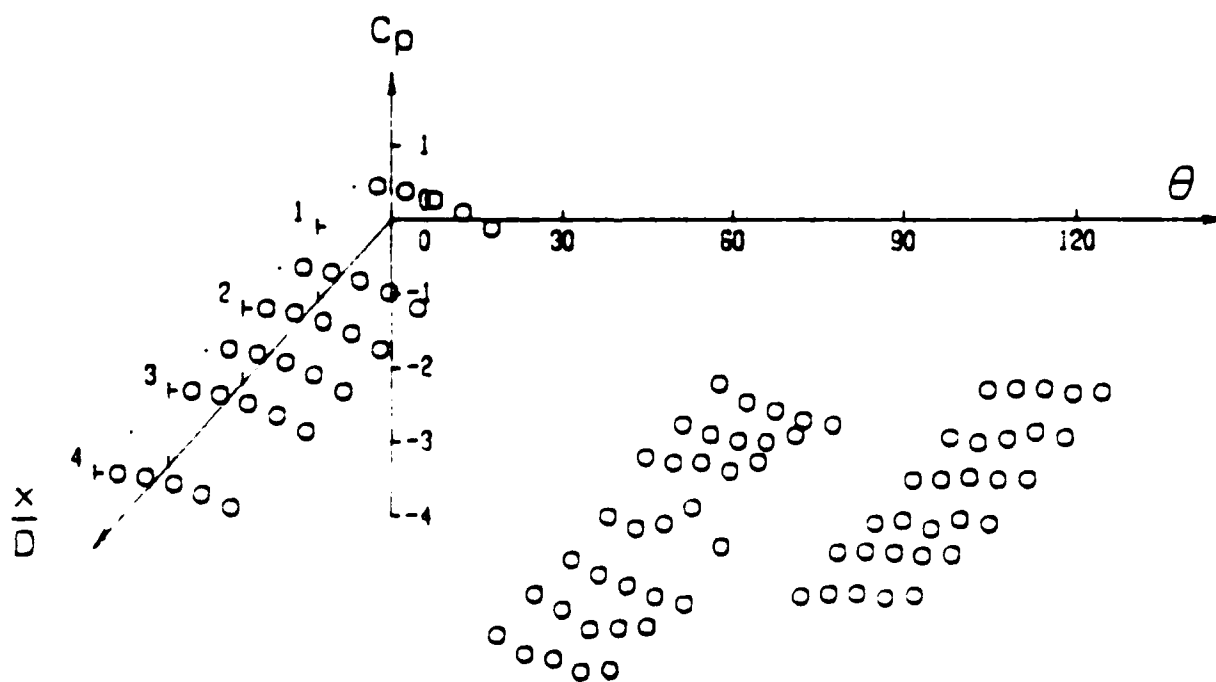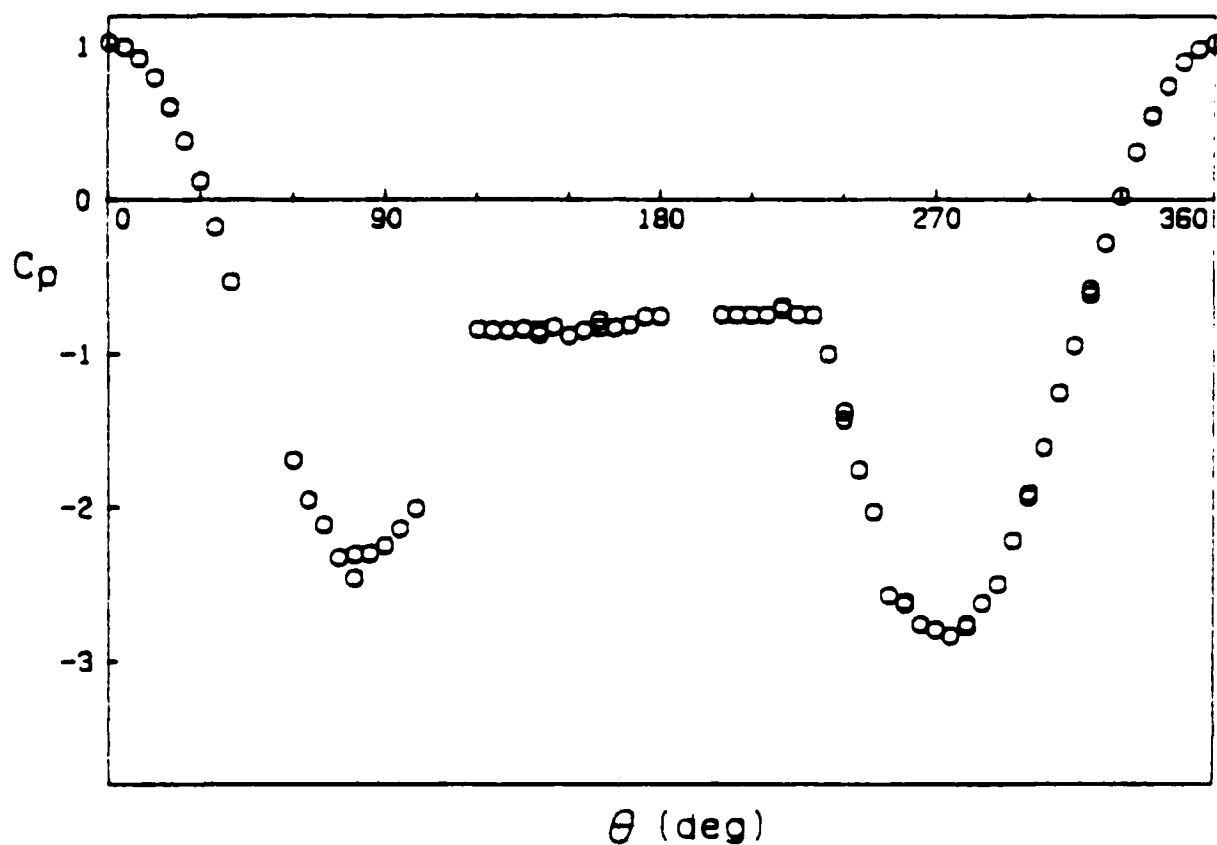
[ROUGH CYLINDER]

Re= 1.025 x10⁶   K/D= 0.0003   RUN ID= 196

θ (deg)

II-7
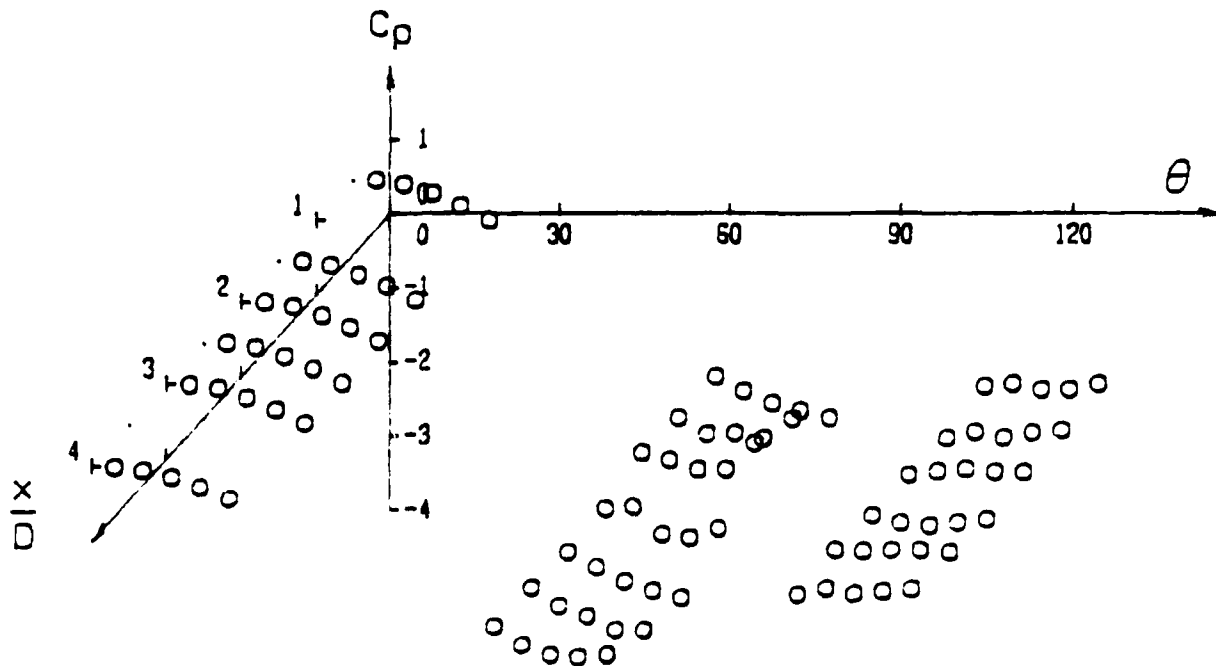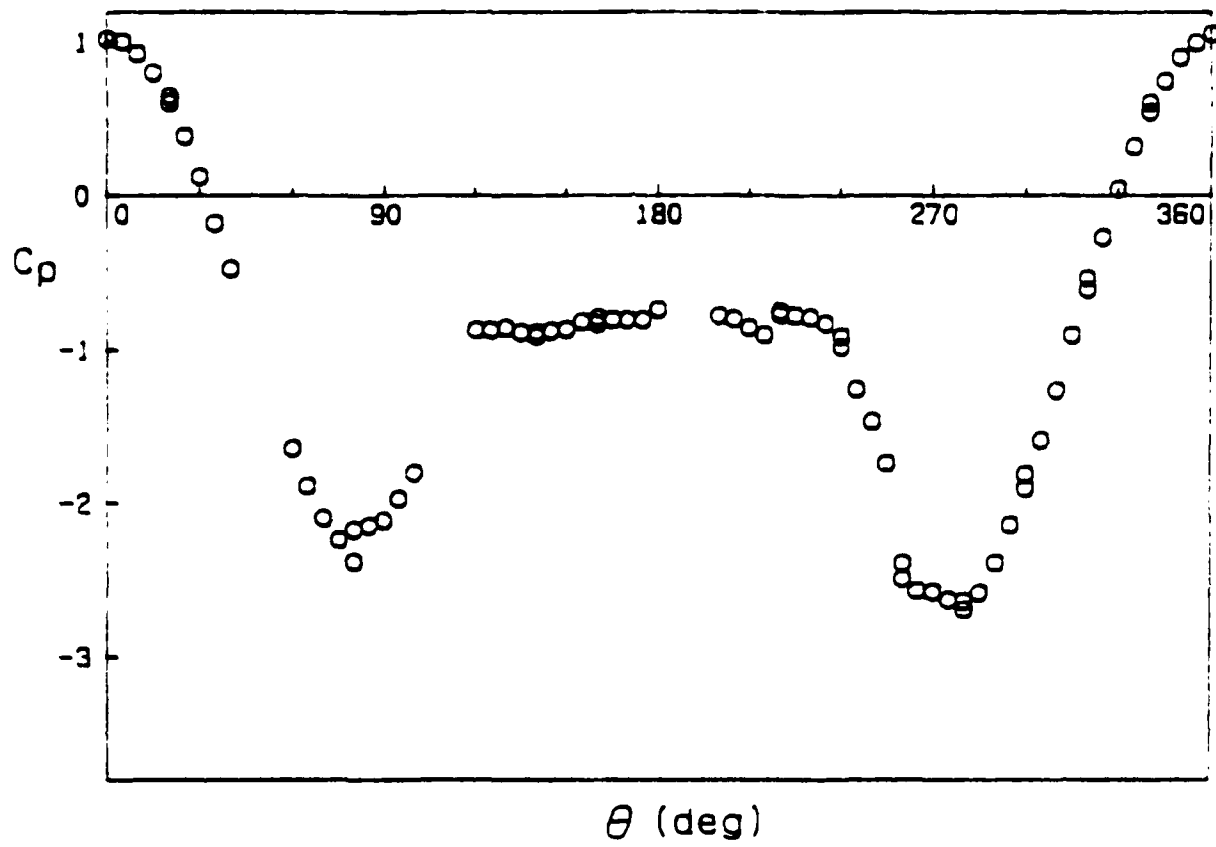
[ROUGH CYLINDER]

Re= 1.195 x10⁸   K/D= 0.0003   RUN ID= 210
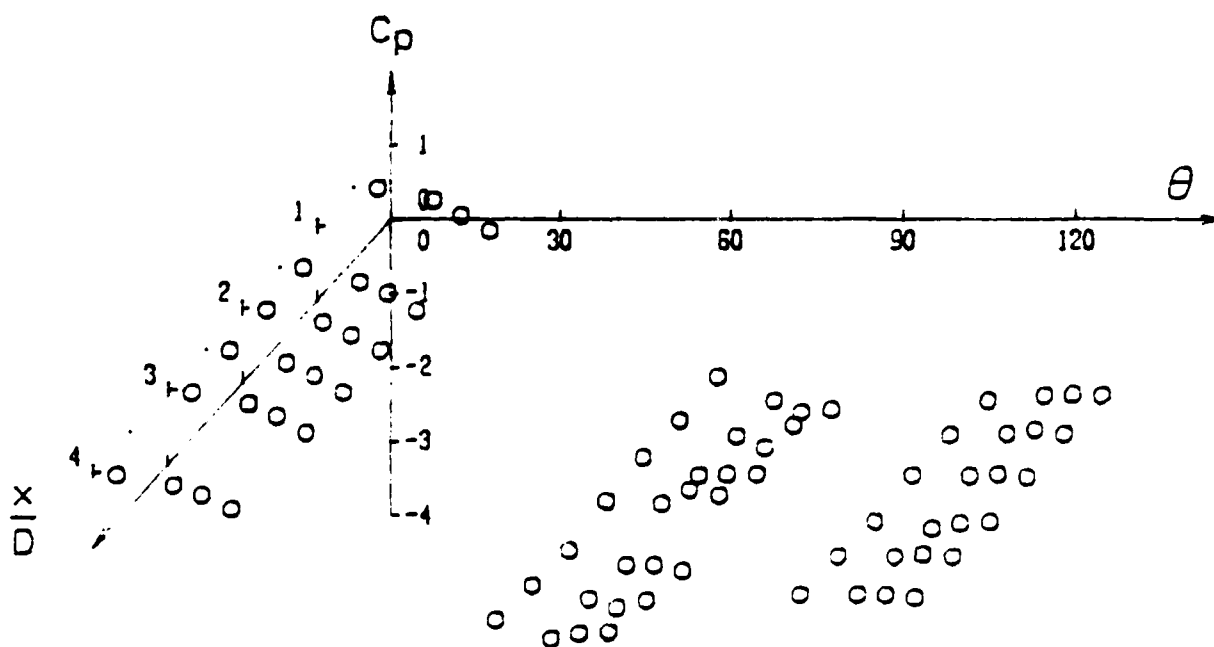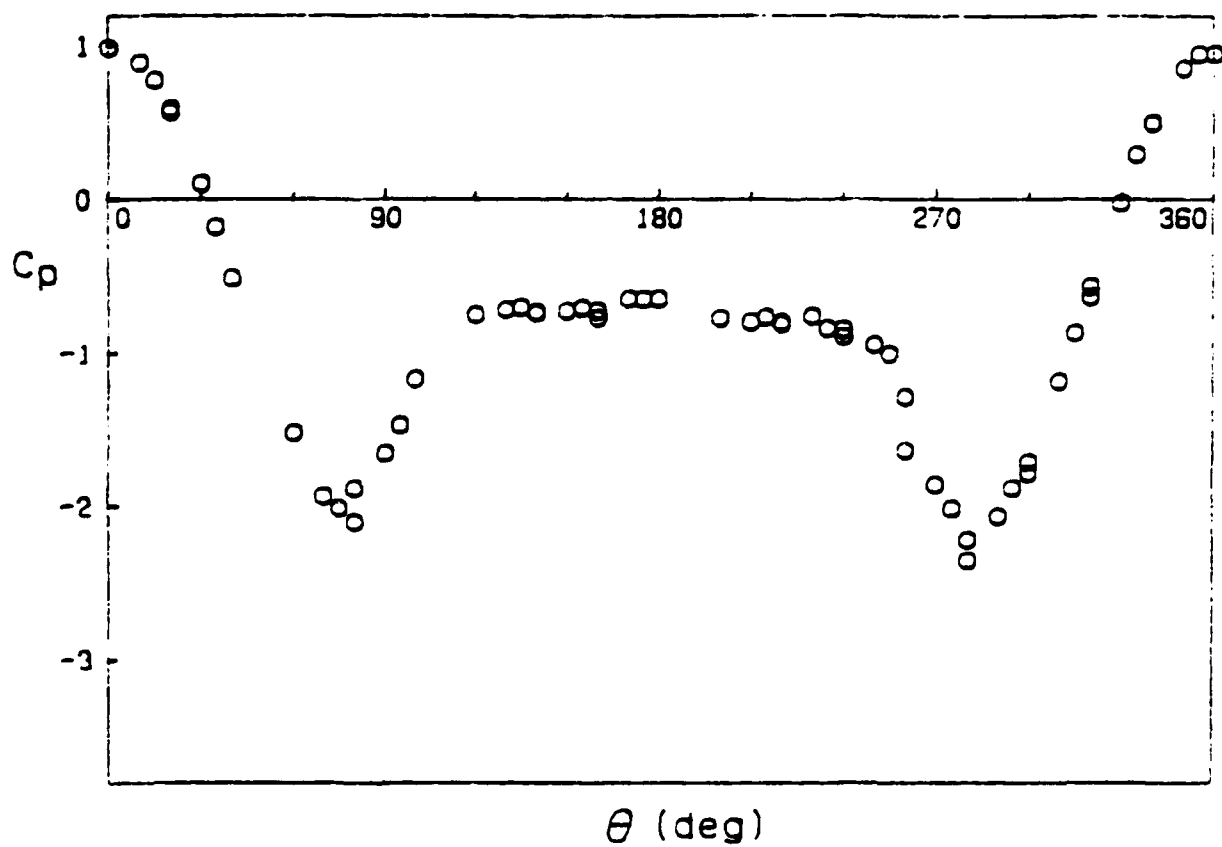
[ROUGH CYLINDER]

Re= 1.267 x10⁶   K/D= 0.0003   RUN ID= 198

θ (deg)
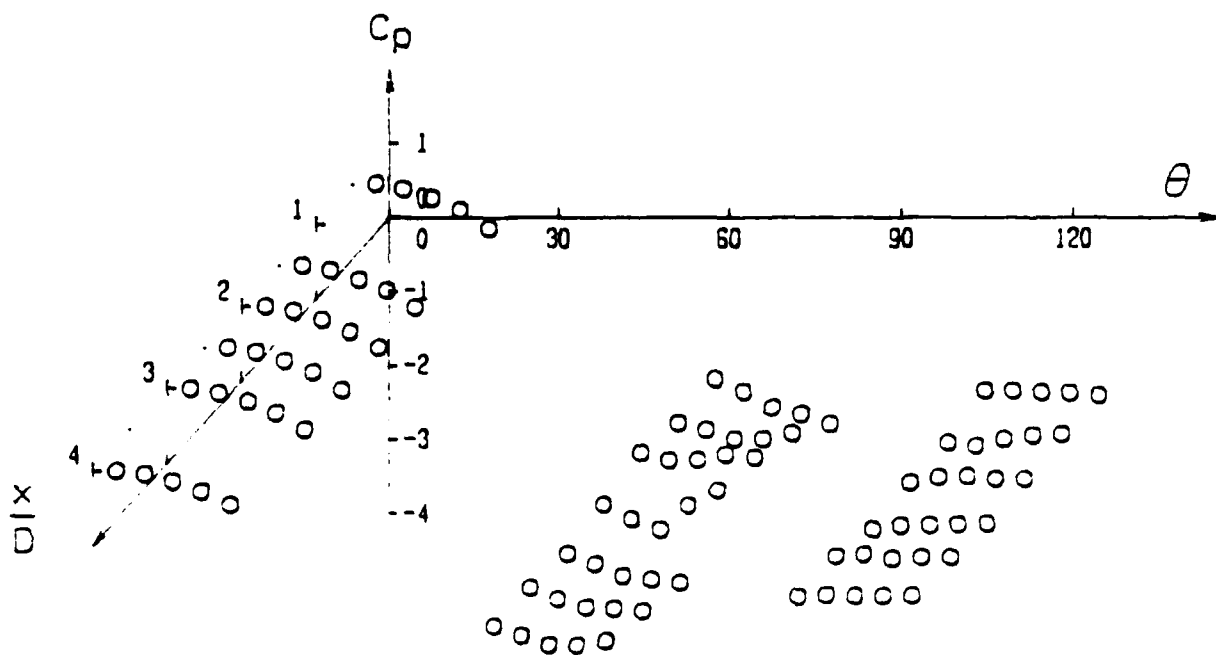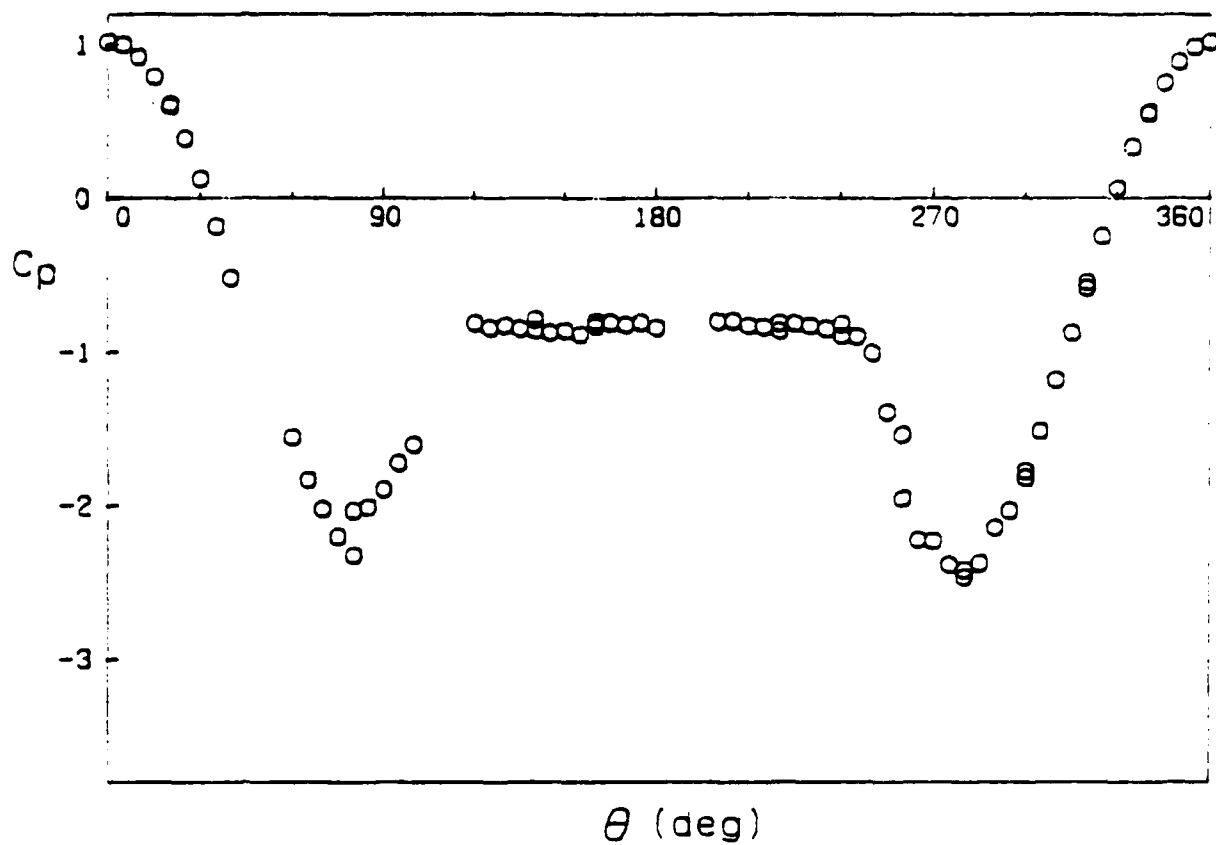
[ROUGH CYLINDER]

Re= 1.532 ×10^6 K/D= 0.0003   RUN ID= 199

θ (deg)
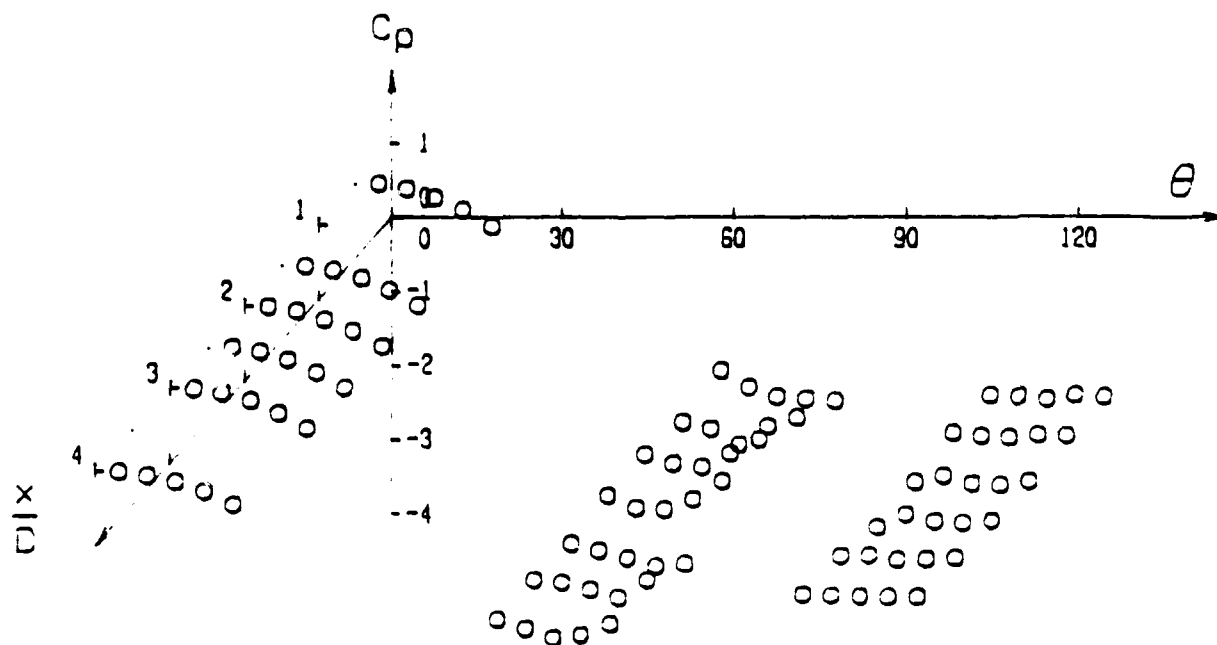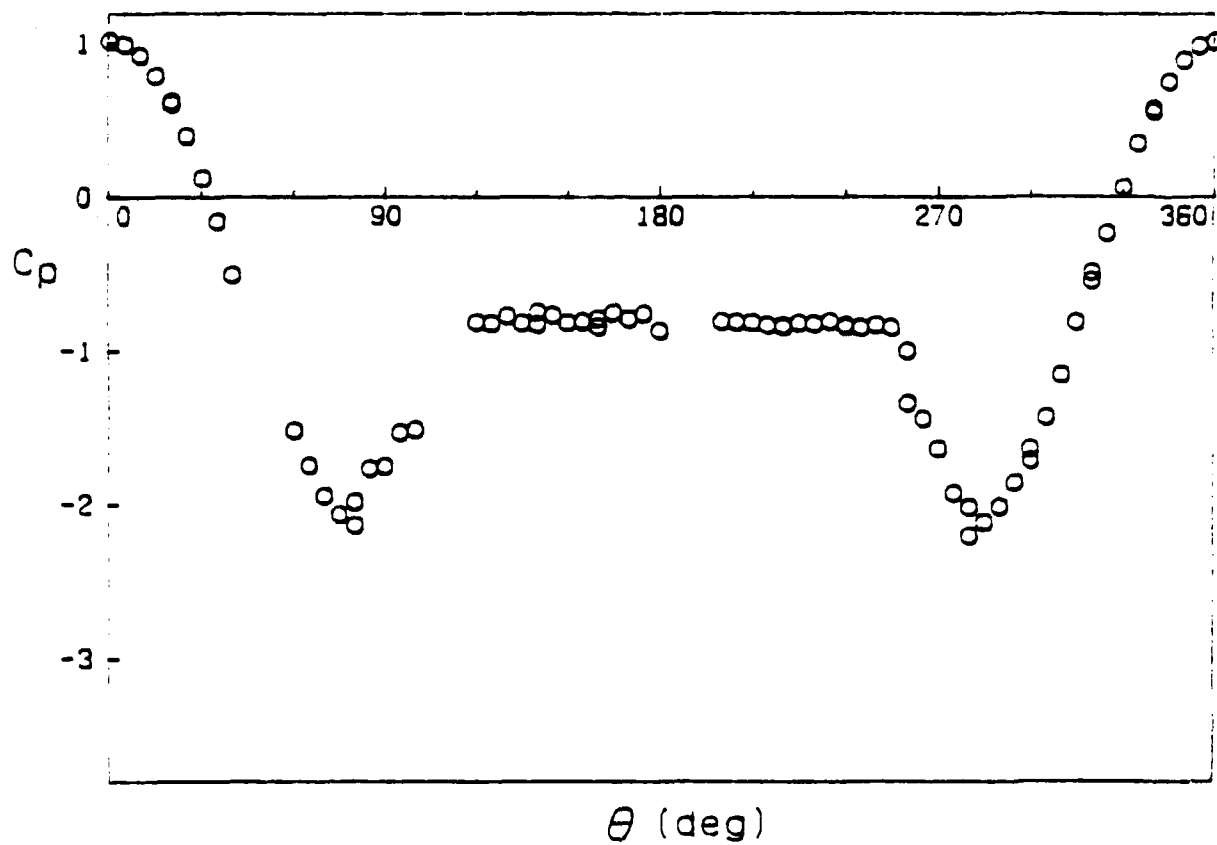
[ROUGH CYLINDER]

Re= 1.807 ×10⁶   K/D= 0.0003   RUN ID= 211
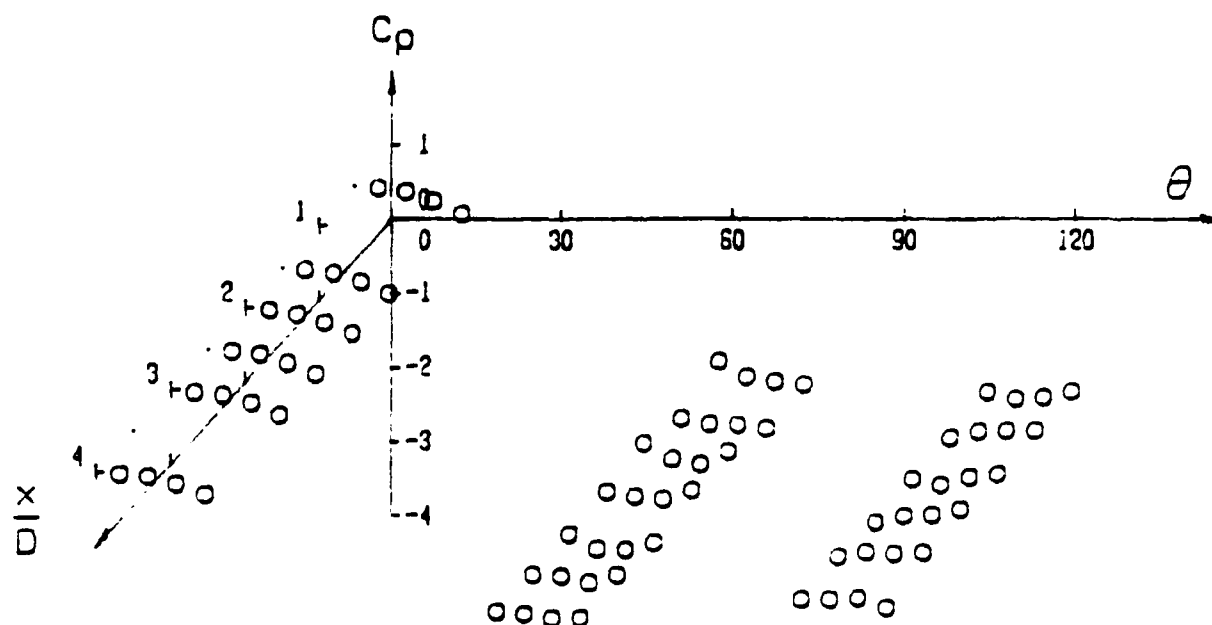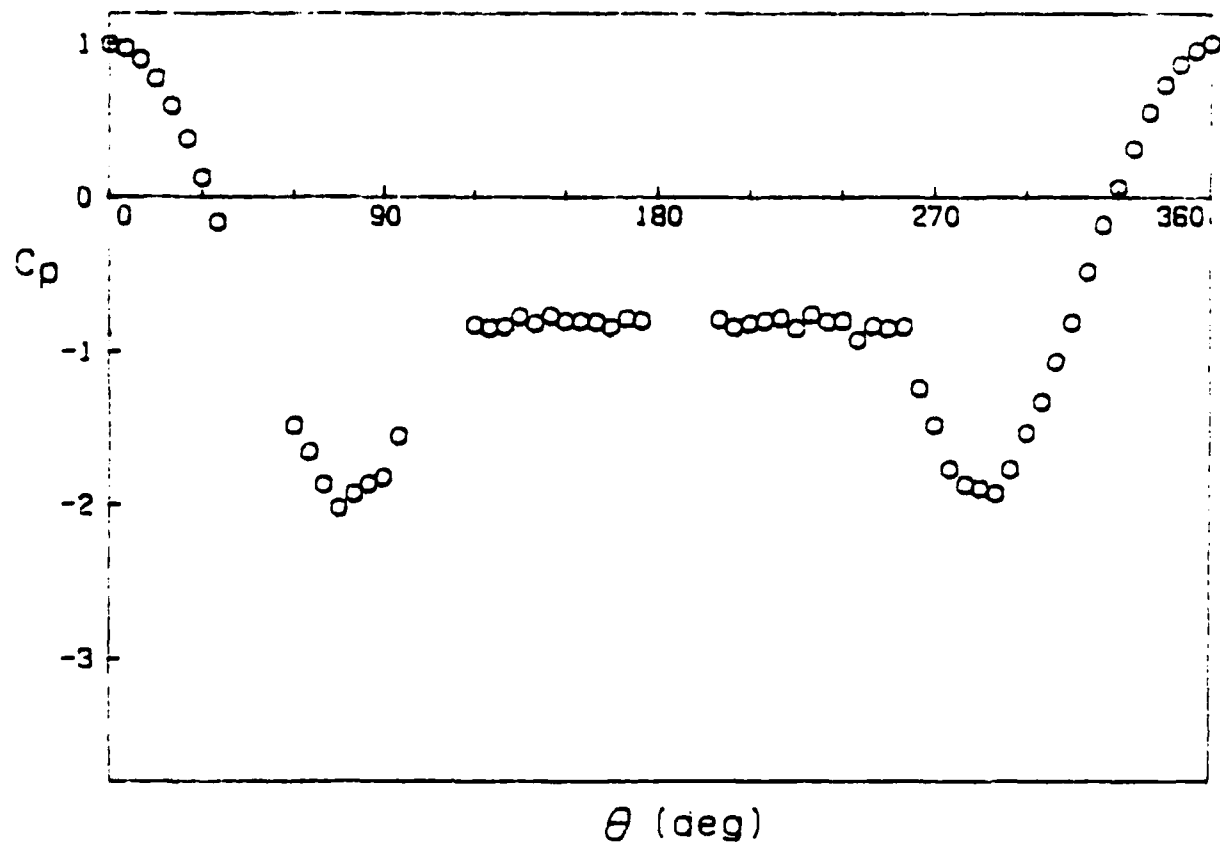
[ROUGH CYLINDER]

Re= 2.076 x10^6 k/D= 0.0003   RUN ID= 200

II-12
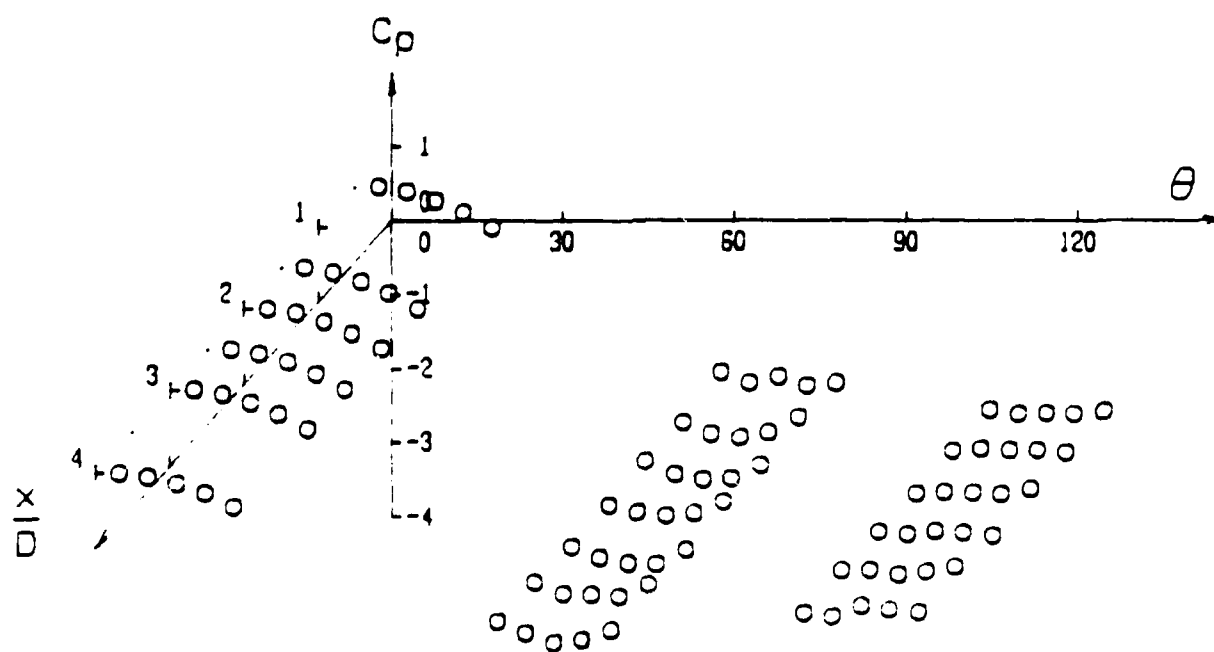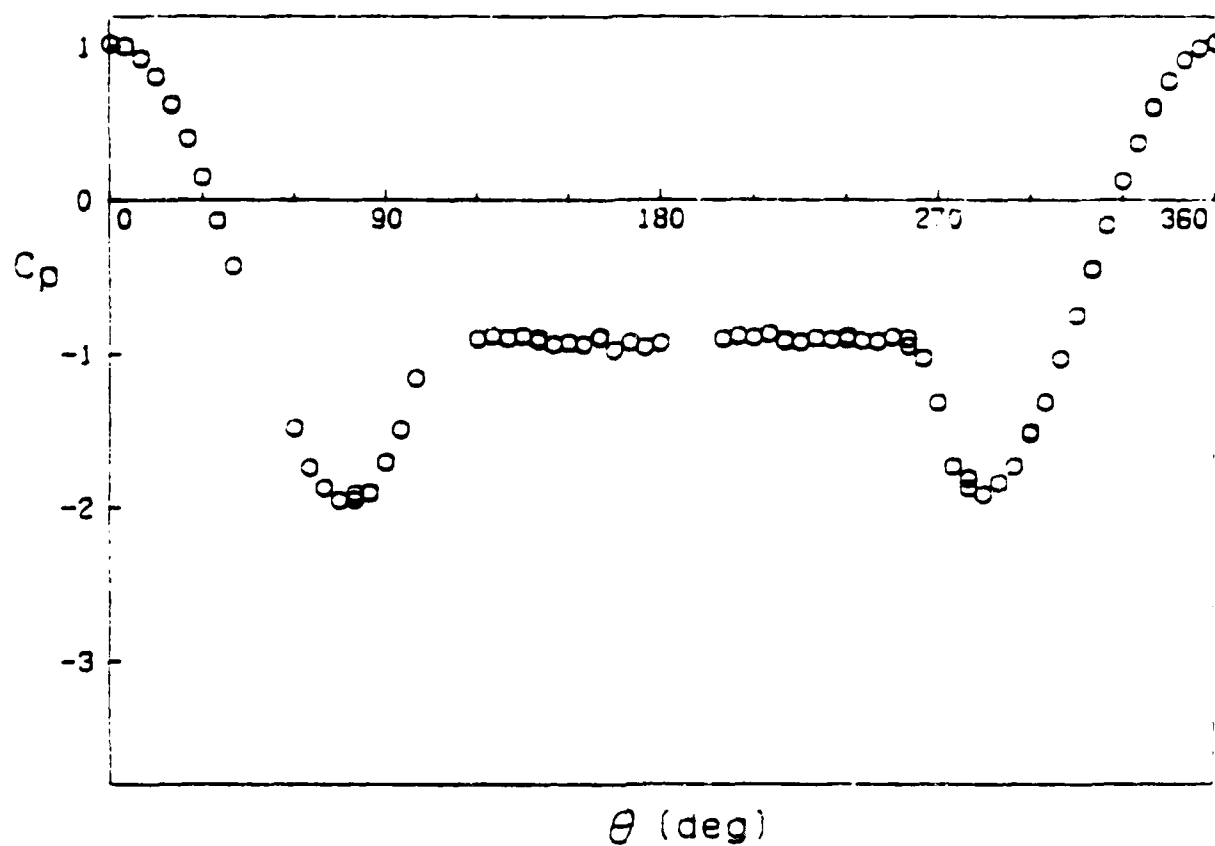
[ROUGH CYLINDER]

Re= 2.982 x10⁸   k/D= 0.0003   RUN ID= 212
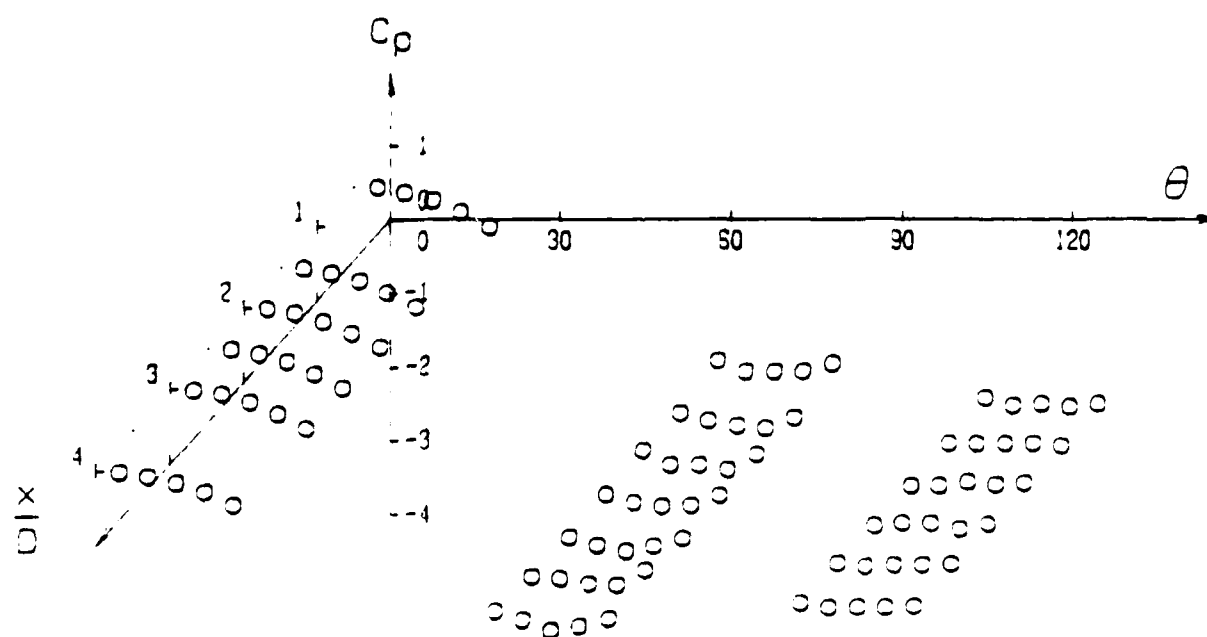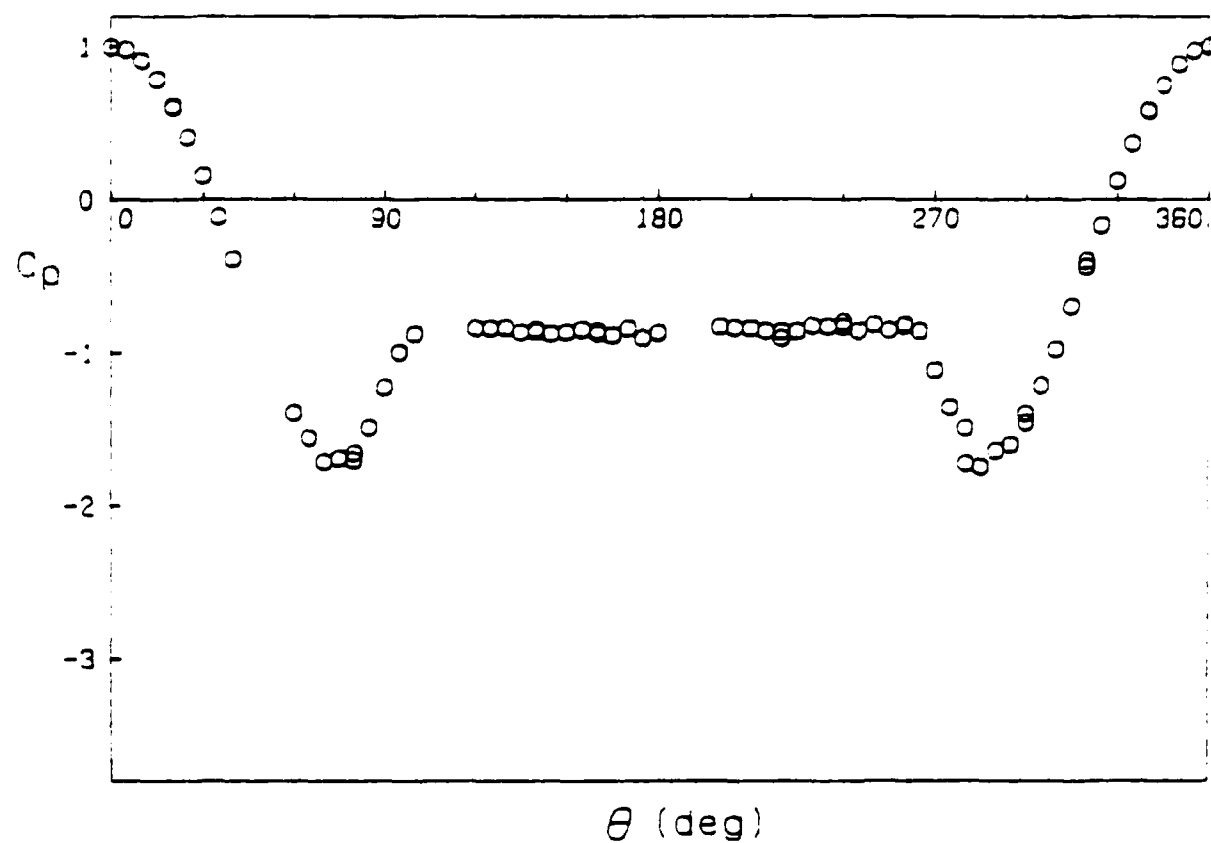
[ROUGH CYLINDER]

Re= 3.109 x10^6 K/D= 0.0003   RUN ID= 202
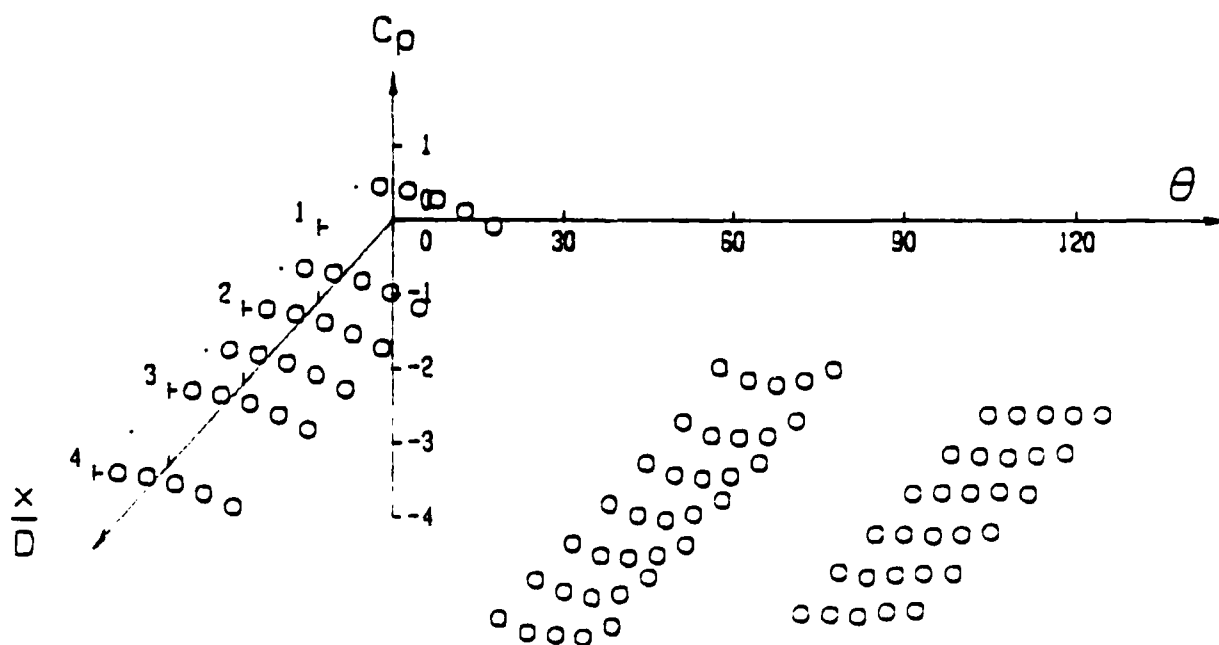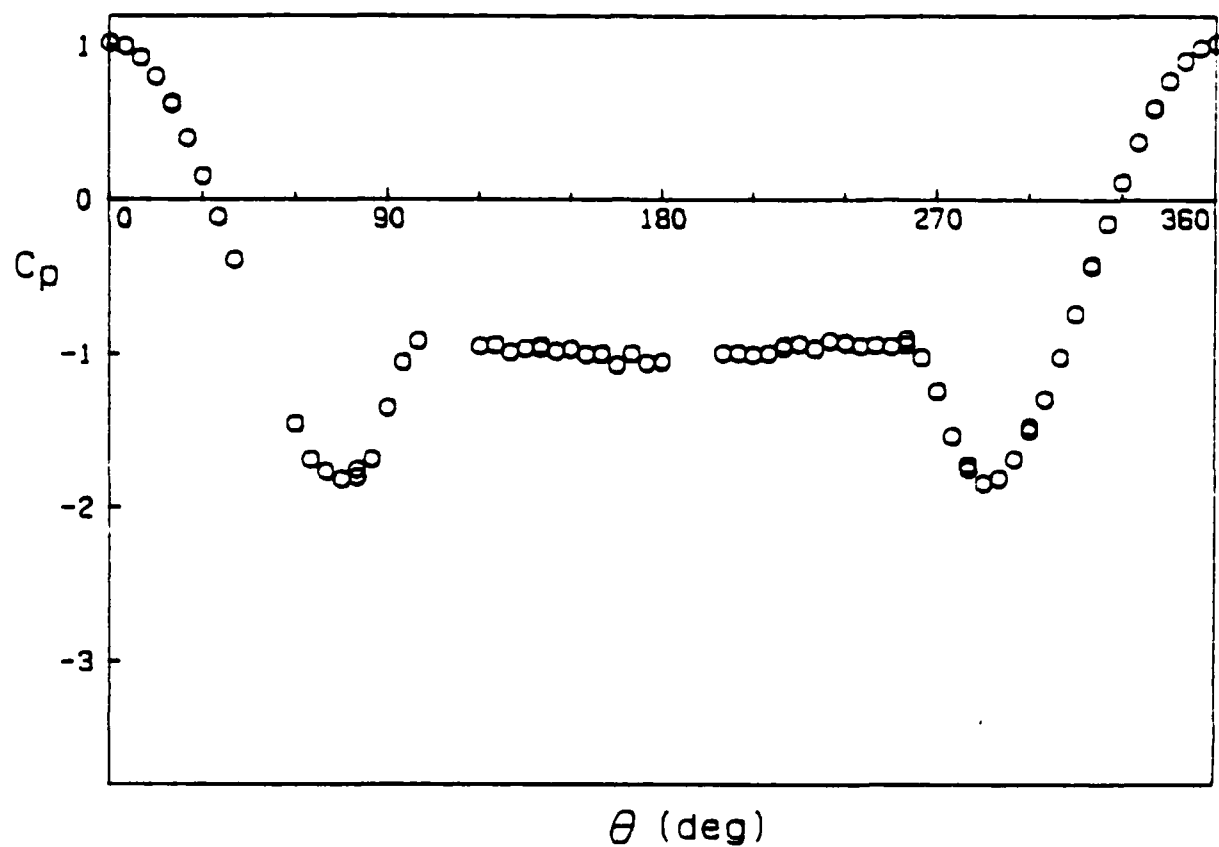
[ROUGH CYLINDER]

Re= 3.556 ×10⁶   κ/D= 0.0003   RUN ID= 213
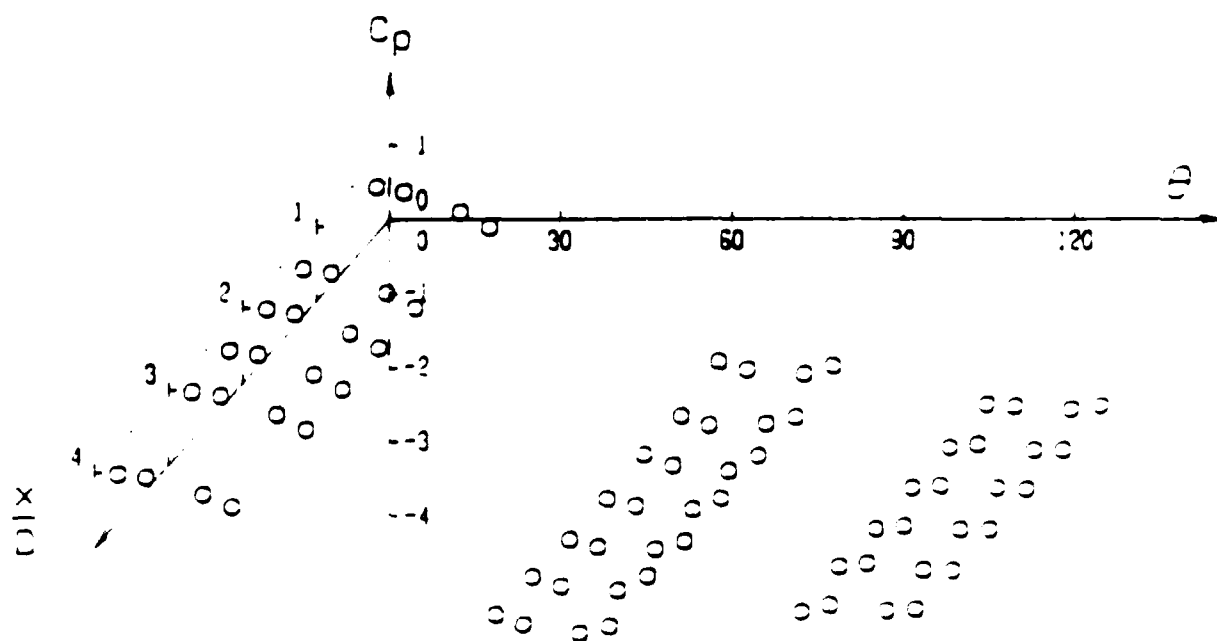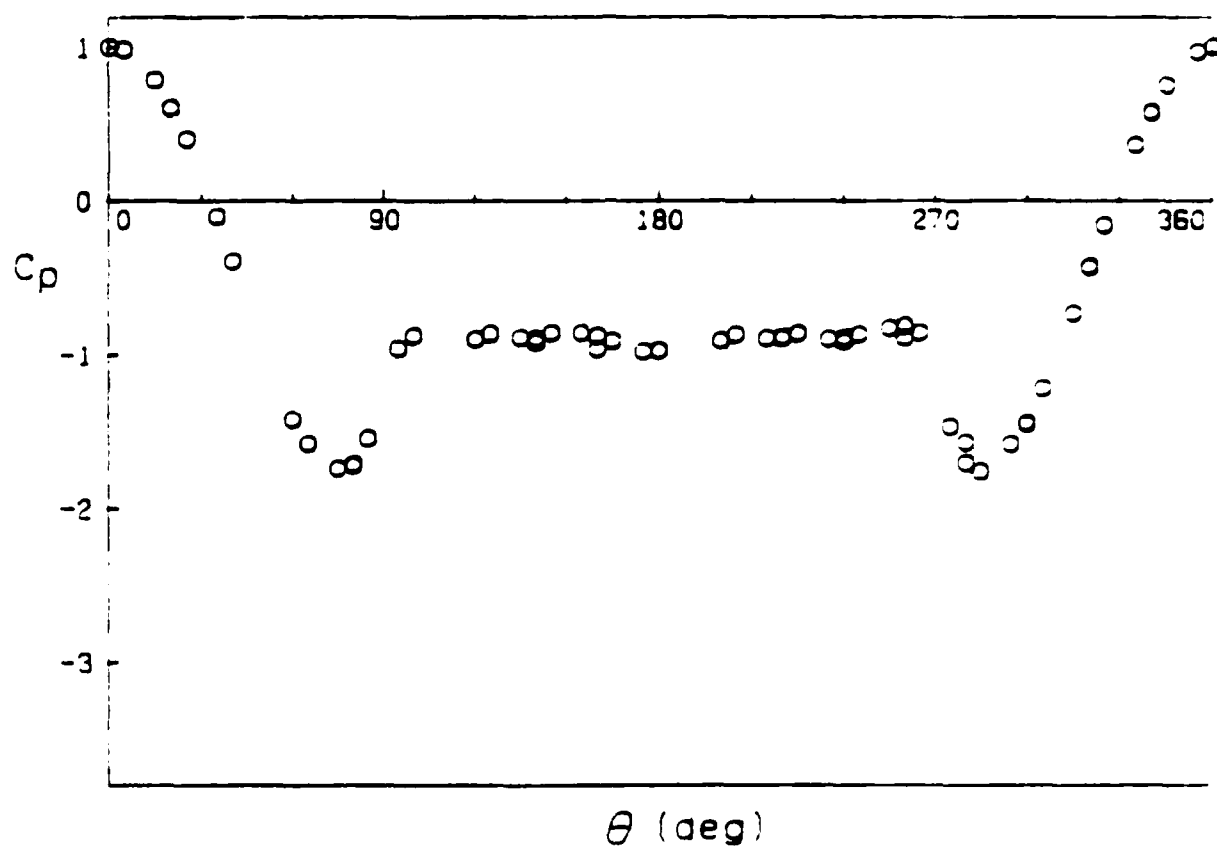
[ROUGH CYLINDER]

Re= 4.109 ×10⁶   k/D= 0.0003   RUN ID= 203
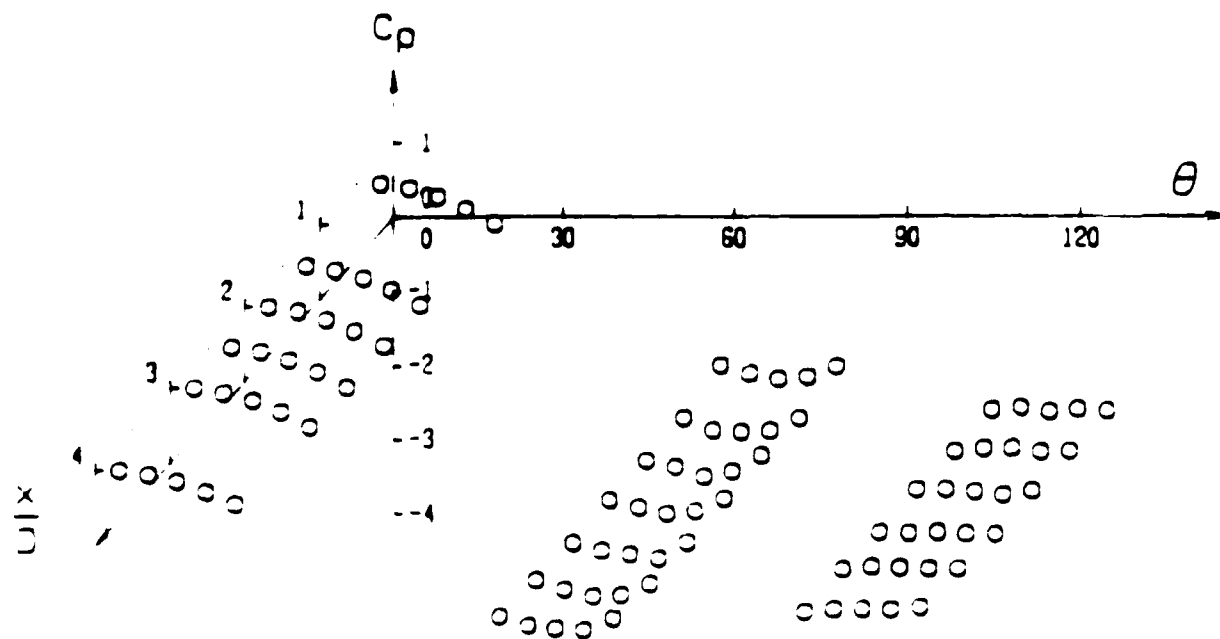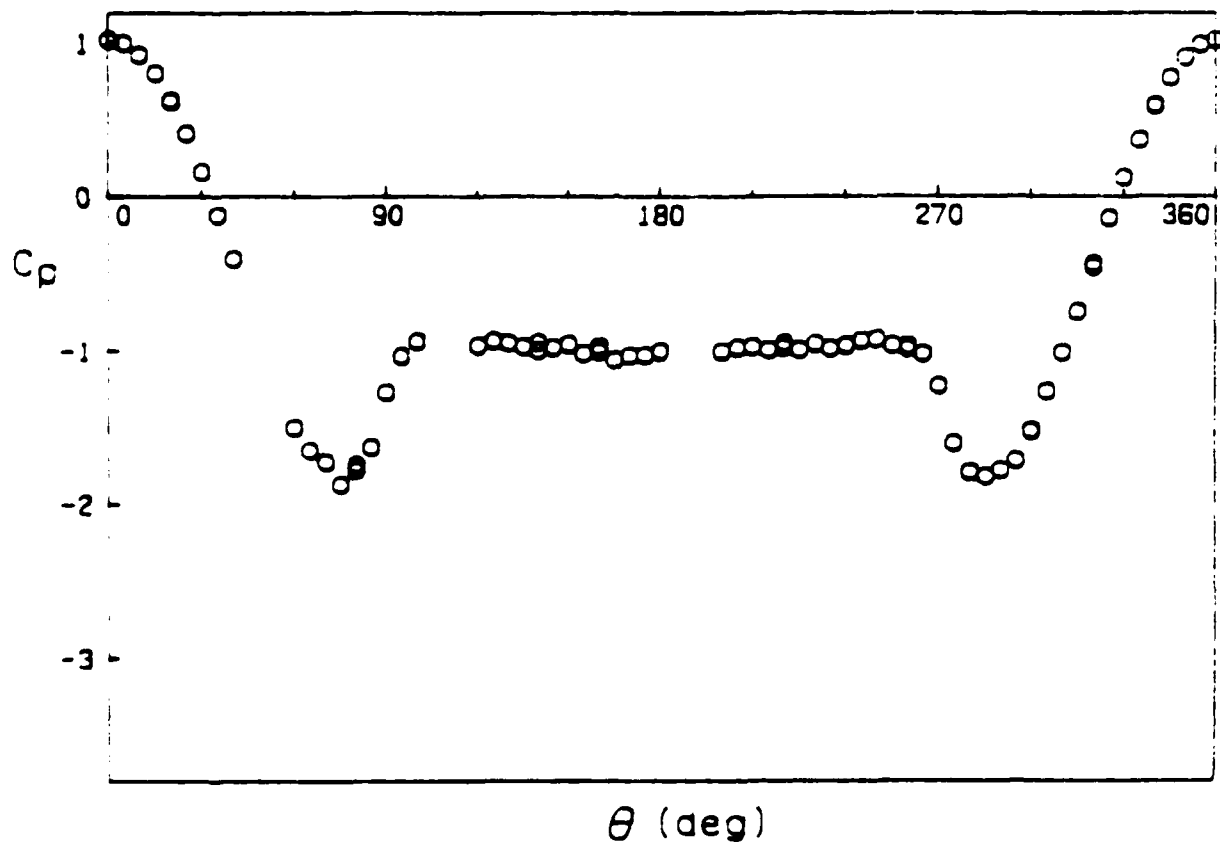
[ROUGH CYLINDER]

Re= 4.405 x10^6 K/D= 0.0003   RUN ID= 214

C_p

θ (deg)

C_p

θ
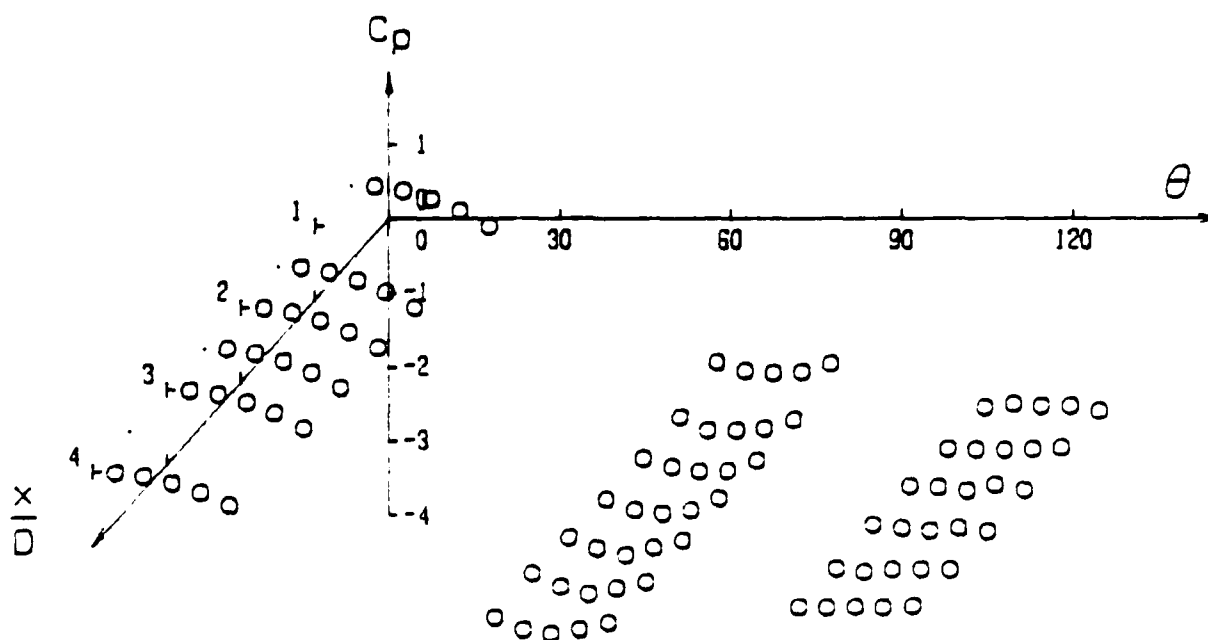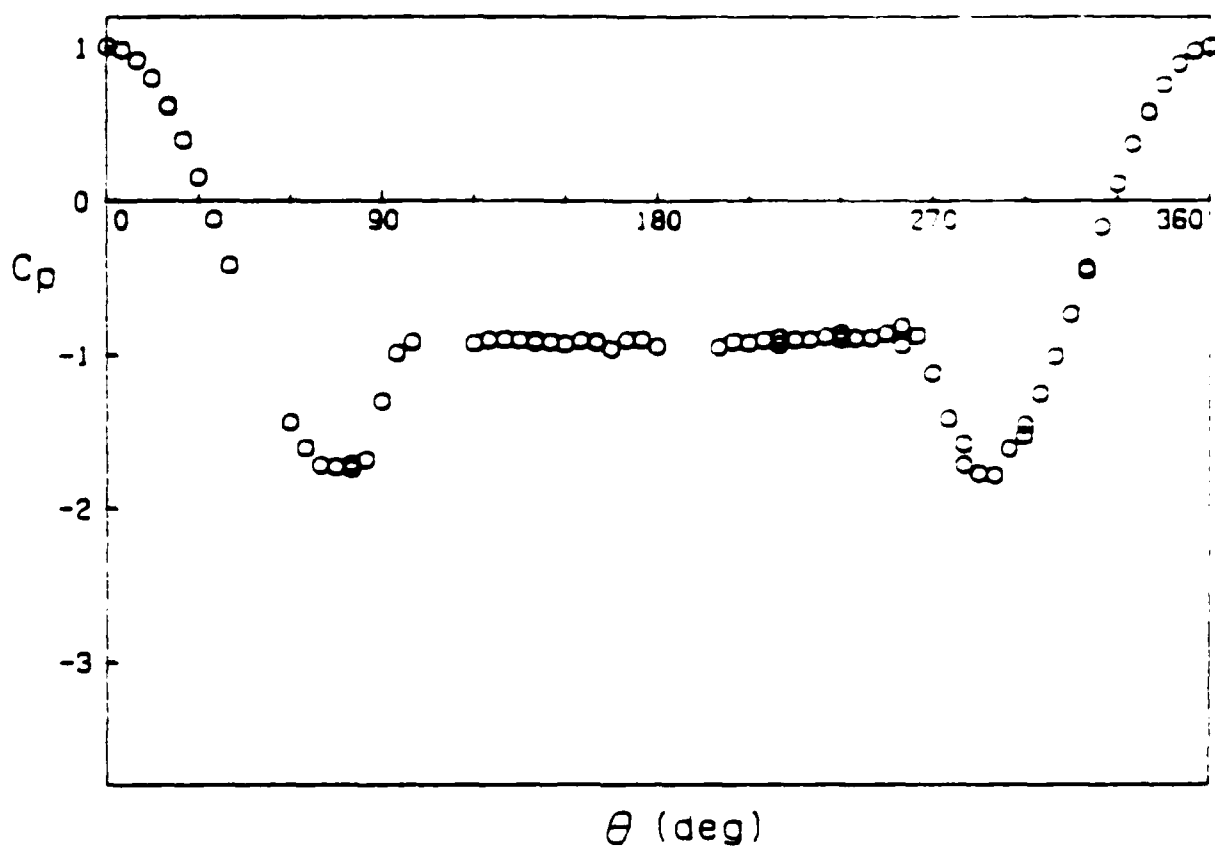
[ROUGH CYLINDER]

Re= 5.143 $\times 10^6$ k/D= 0.0003   RUN ID= 204

θ (deg)
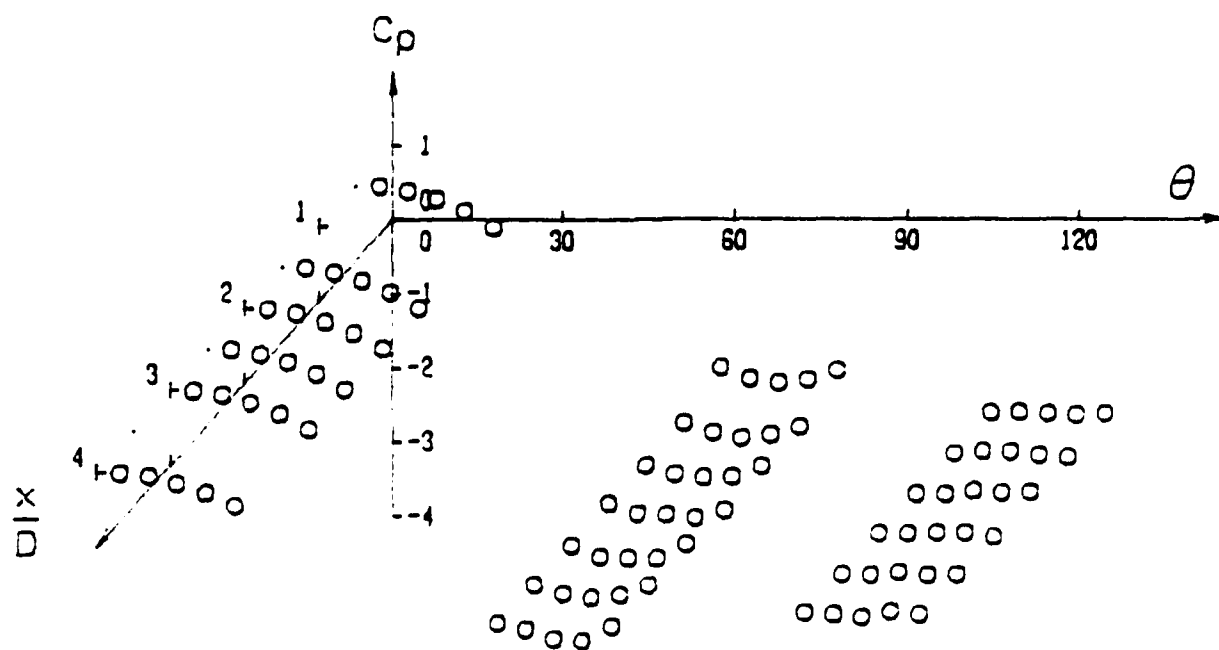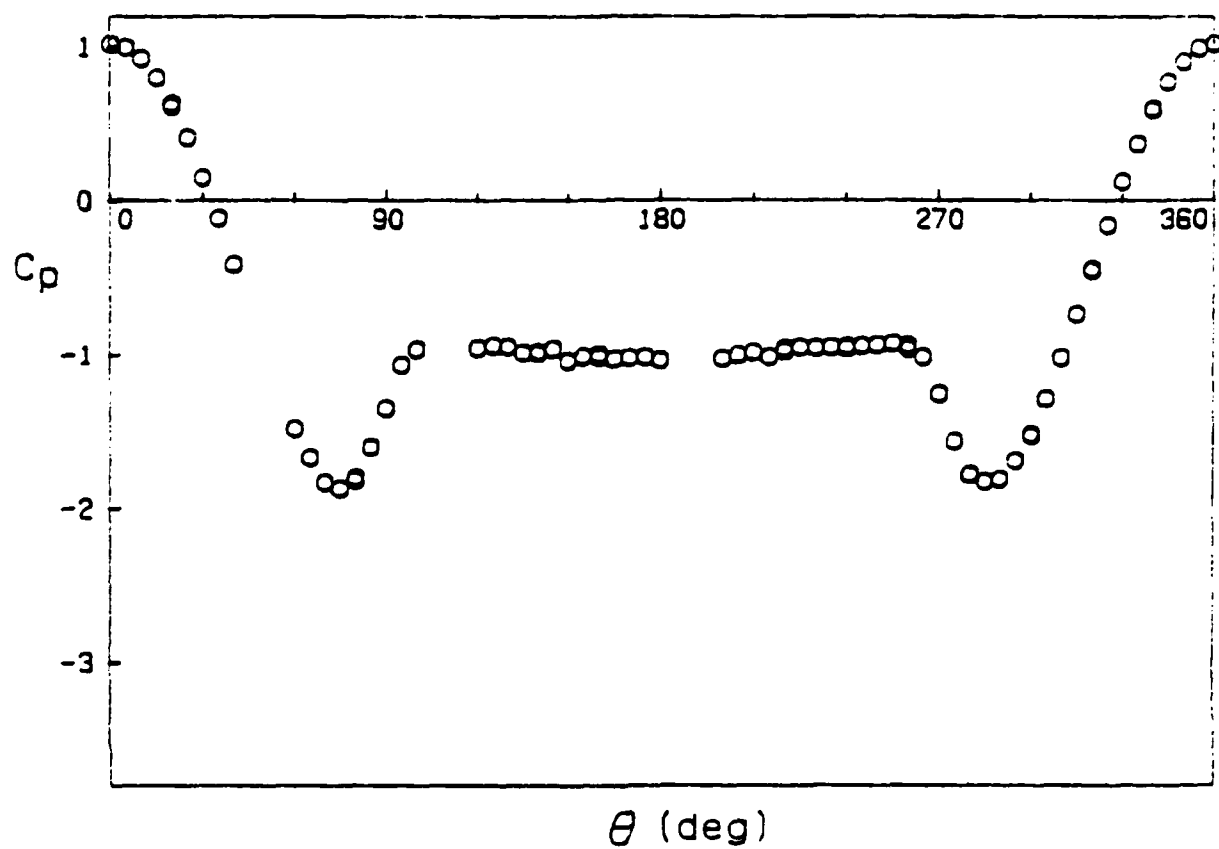
[ROUGH CYLINDER]

Re= 5.208 ×10⁶   k/D= 0.0003   RUN ID= 215

θ (deg)
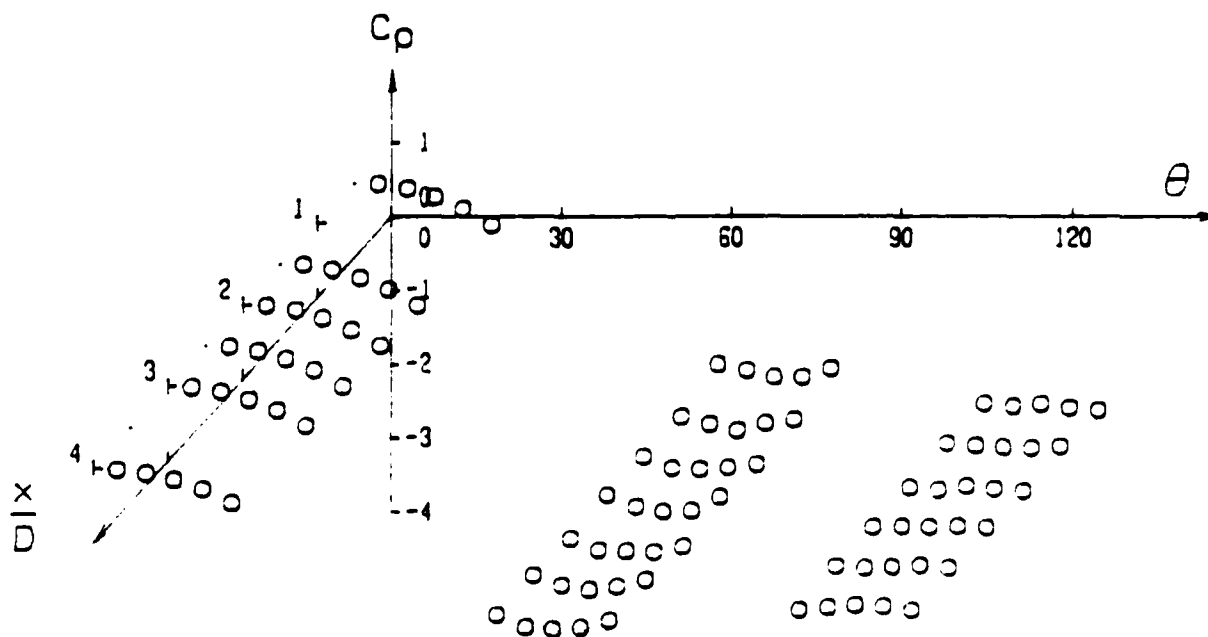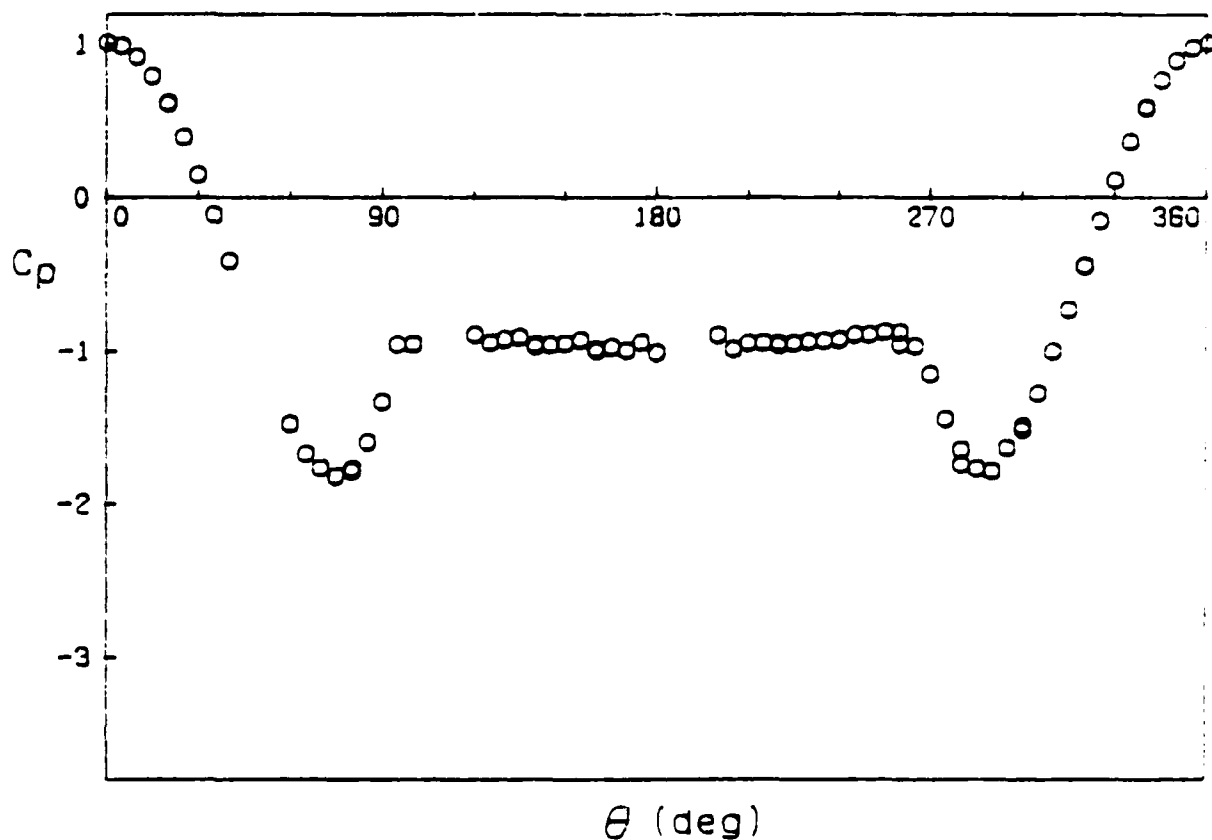
[ROUGH CYLINDER]

Re= 6.192 ×10⁶   K/D= 0.0003   RUN ID= 205
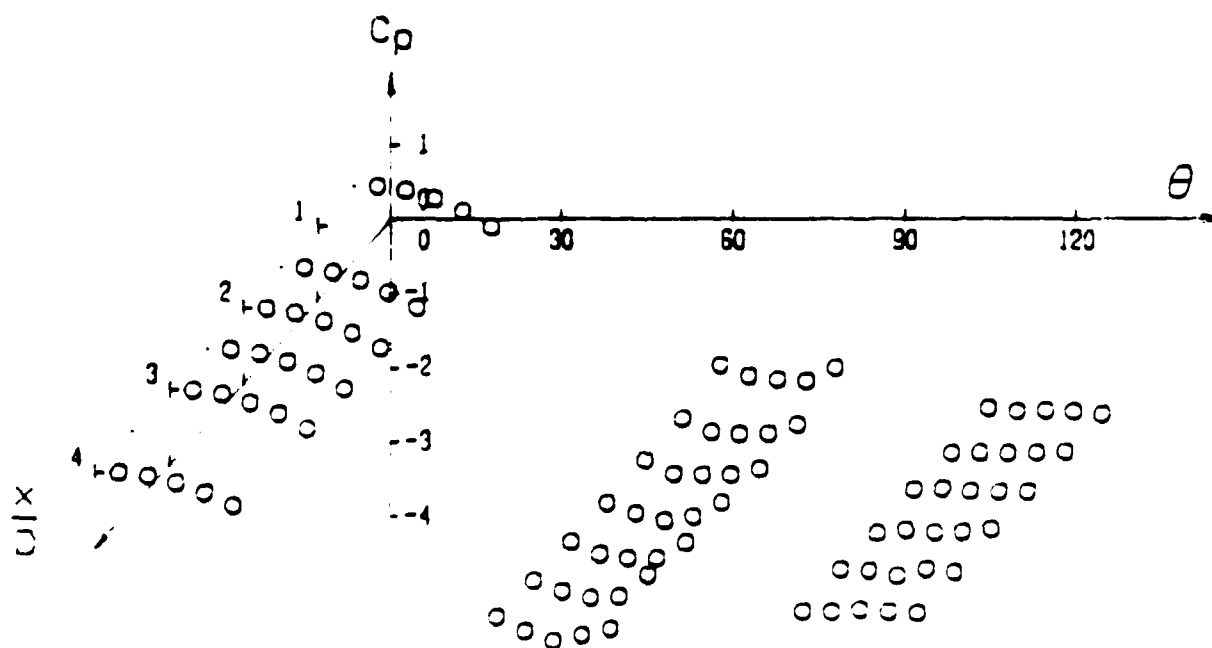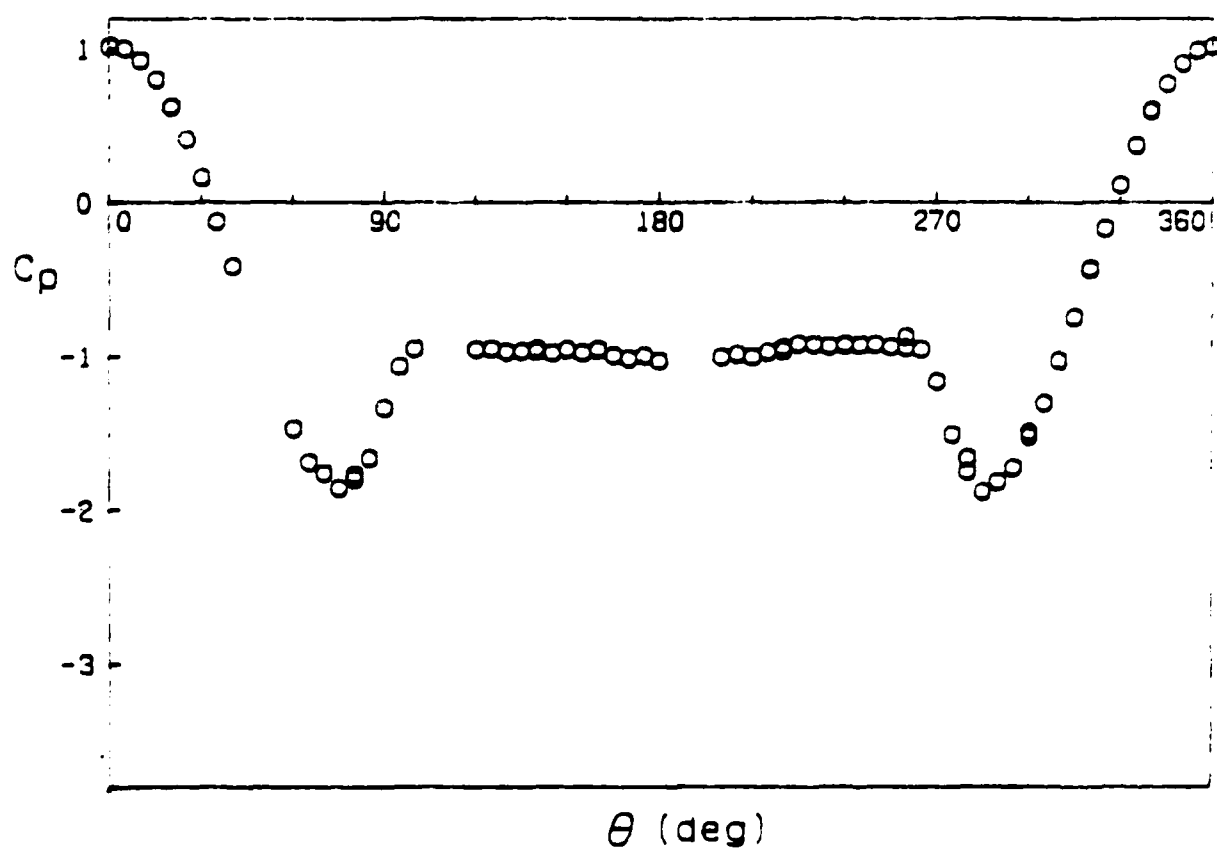
[ROUGH CYLINDER]

Re= 7.009 x10⁶   K/D= 0.0003   RUN ID= 206
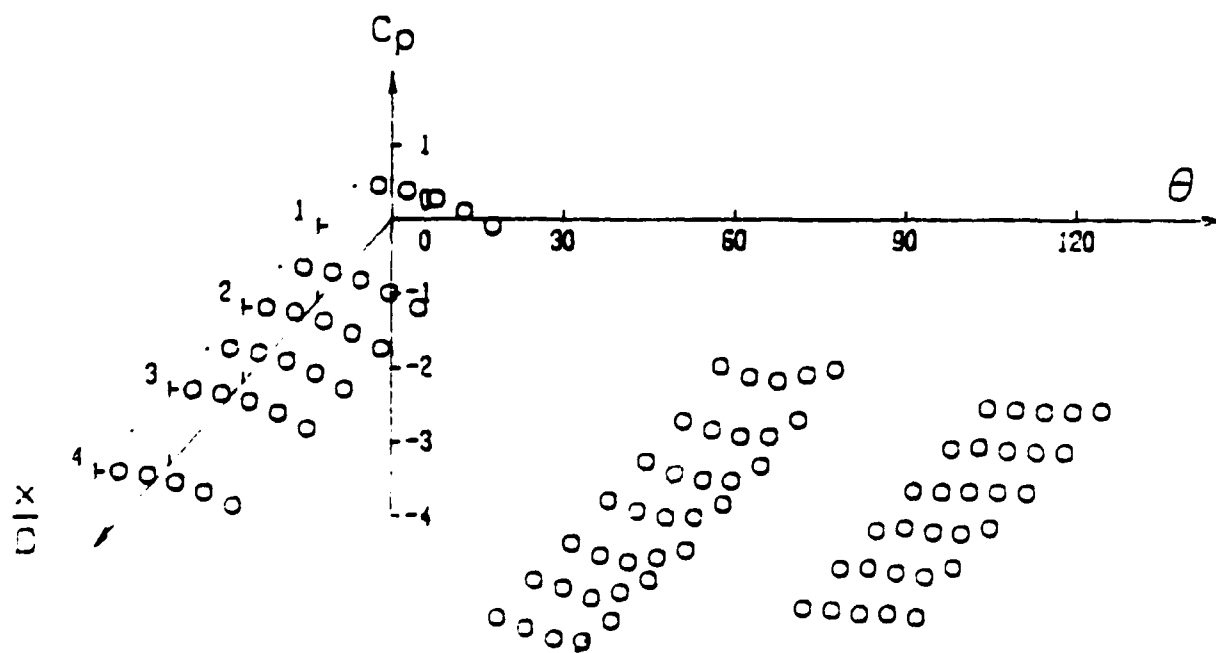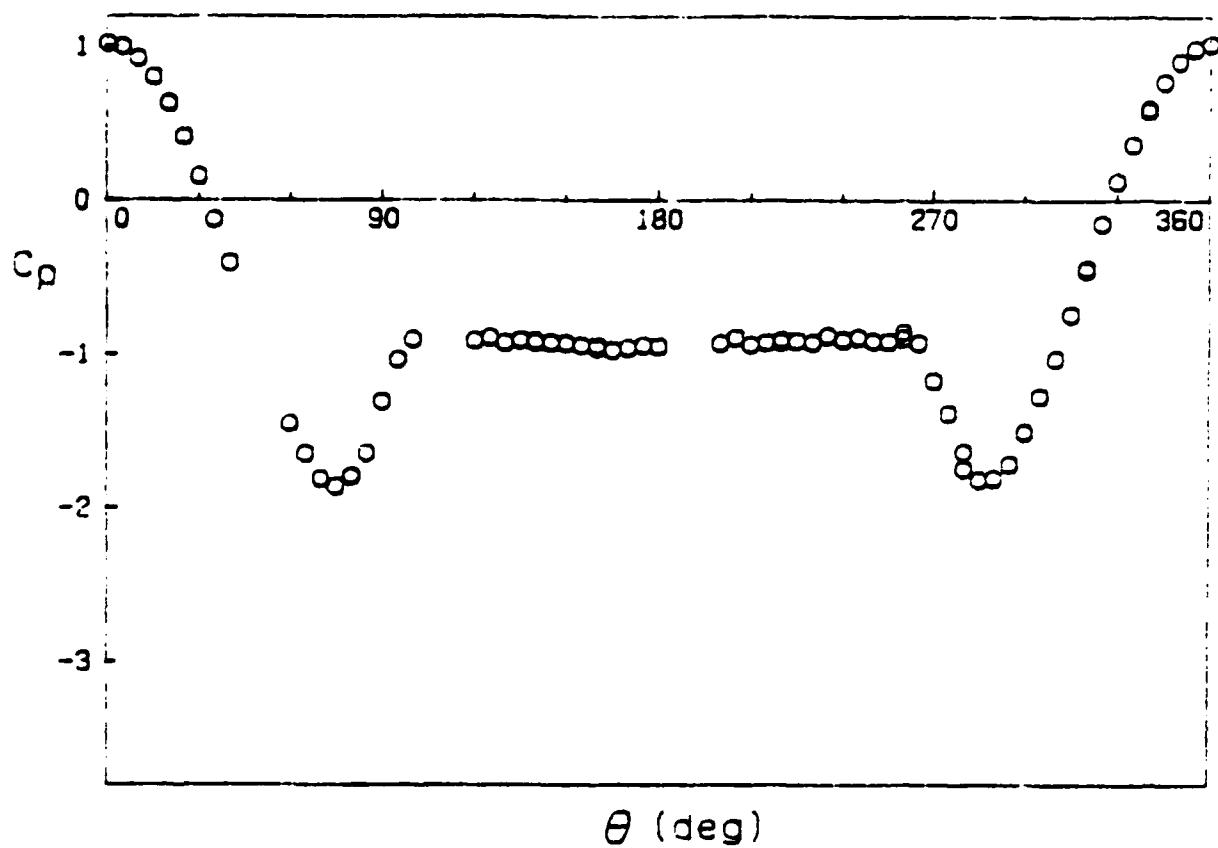
APPENDIX III

PRESSURE DISTRIBUTION PLOTS - CONF3 ROUGH CYLINDER (k/D=0.0012)

RUN ID	Re_D	Cd
226	$0.44 \quad x \ 10^6$	0.818
227	0.51	0.910
228	0.62	0.944
229	0.72	0.943
230	0.83	0.963
231	0.93	0.978
232	1.03	0.995
233	1.28	1.020
234	1.53	1.035
235	1.79	0.997
236	2.06	0.996
237	2.58	0.995
238	3.09	0.987
239	3.59	0.987
240	4.11	0.964
241	5.10	0.965
242	6.12	0.963
243	7.30	0.952

[ROUGH CYLINDER]

Re= 0.435 ×10⁶   K/D= 0.0012   RUN ID= 226

θ (deg)

III-1
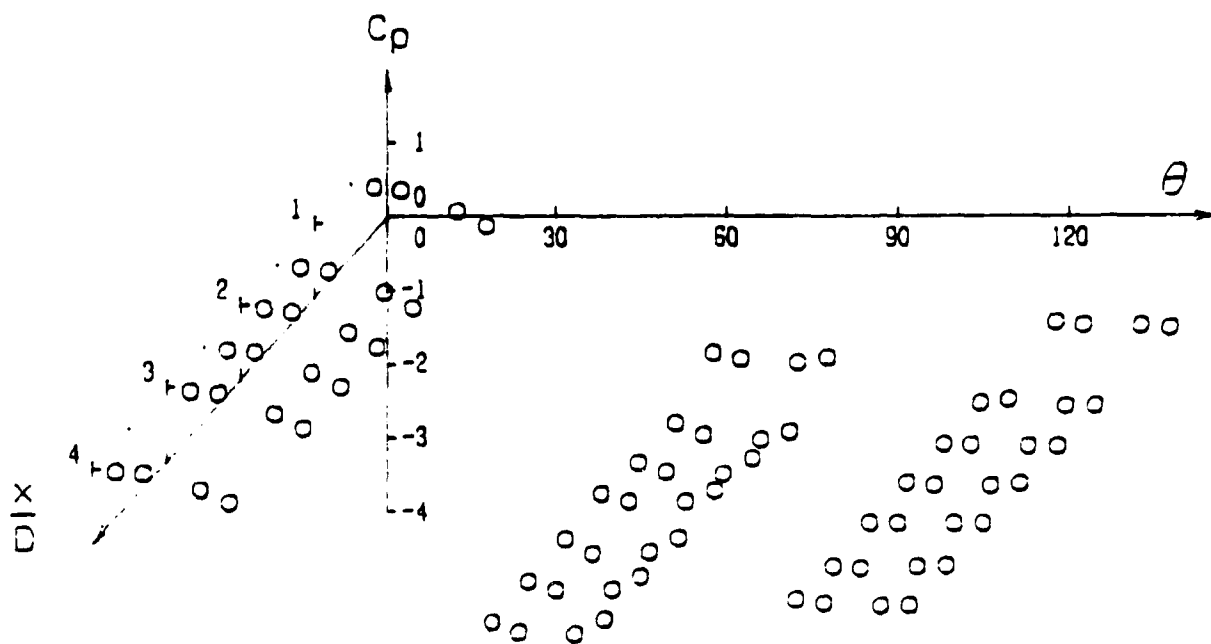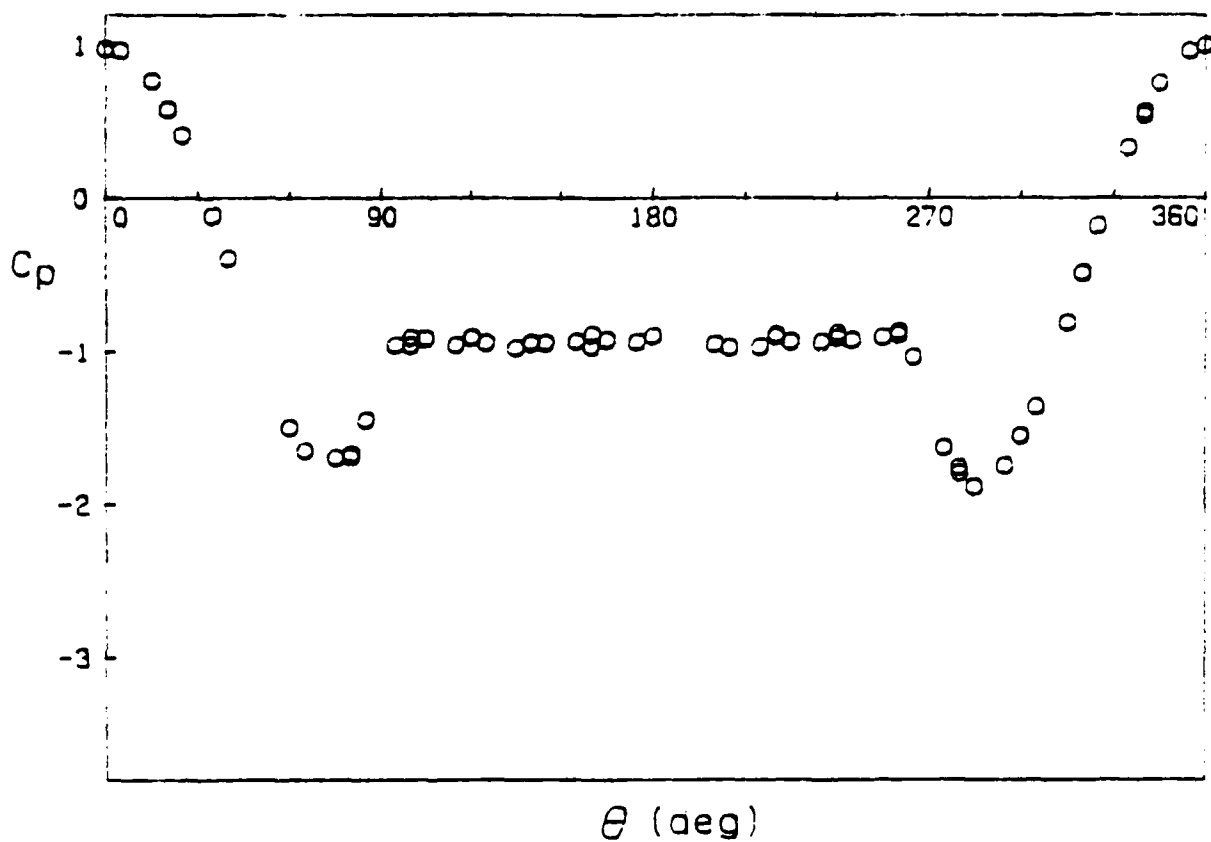
[ROUGH CYLINDER]

Re= 0.50E x10⁶   K/D= 0.0012   RUN ID= 227

θ (deg)
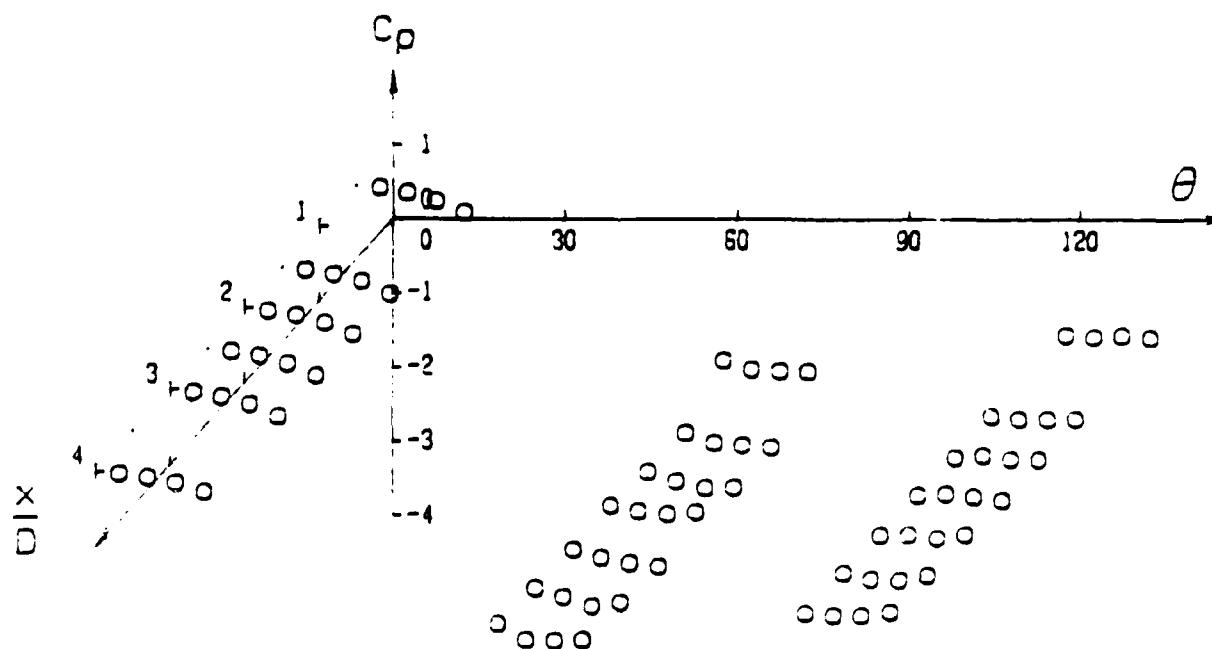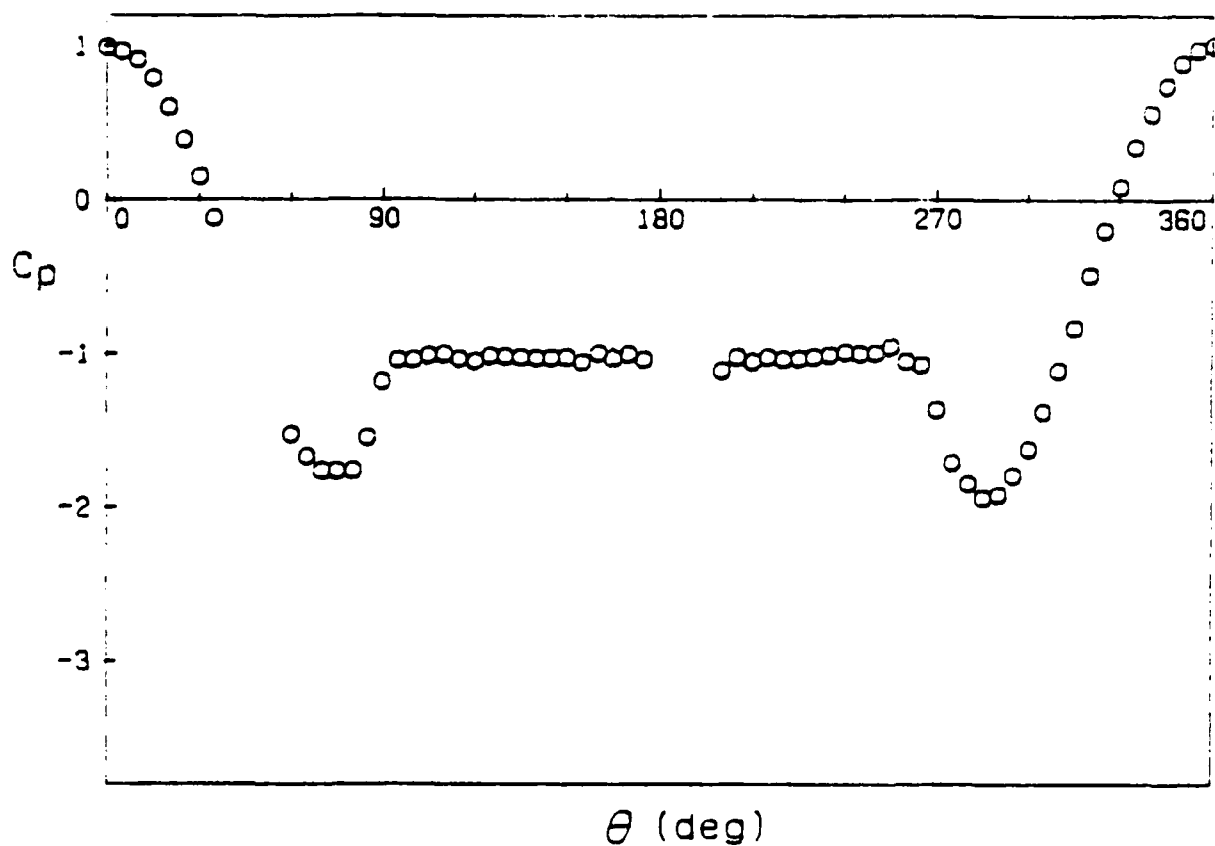
[ROUGH CYLINDER]

Re= 0.617 x10^6 k/D= 0.0012   RUN ID= 228

III-3
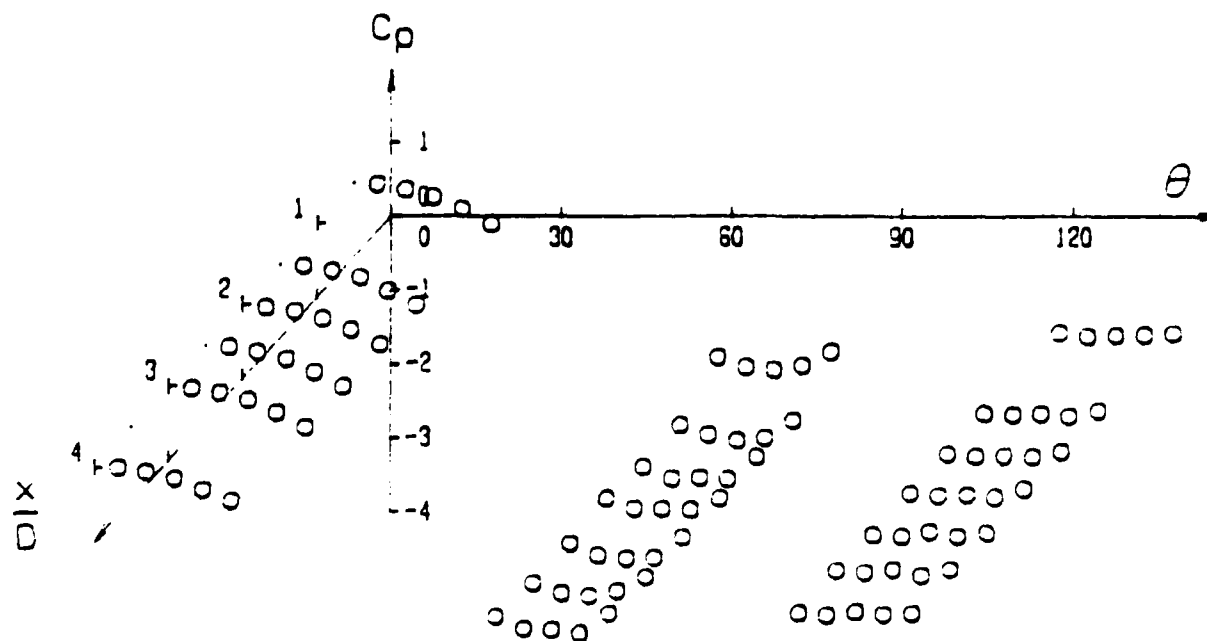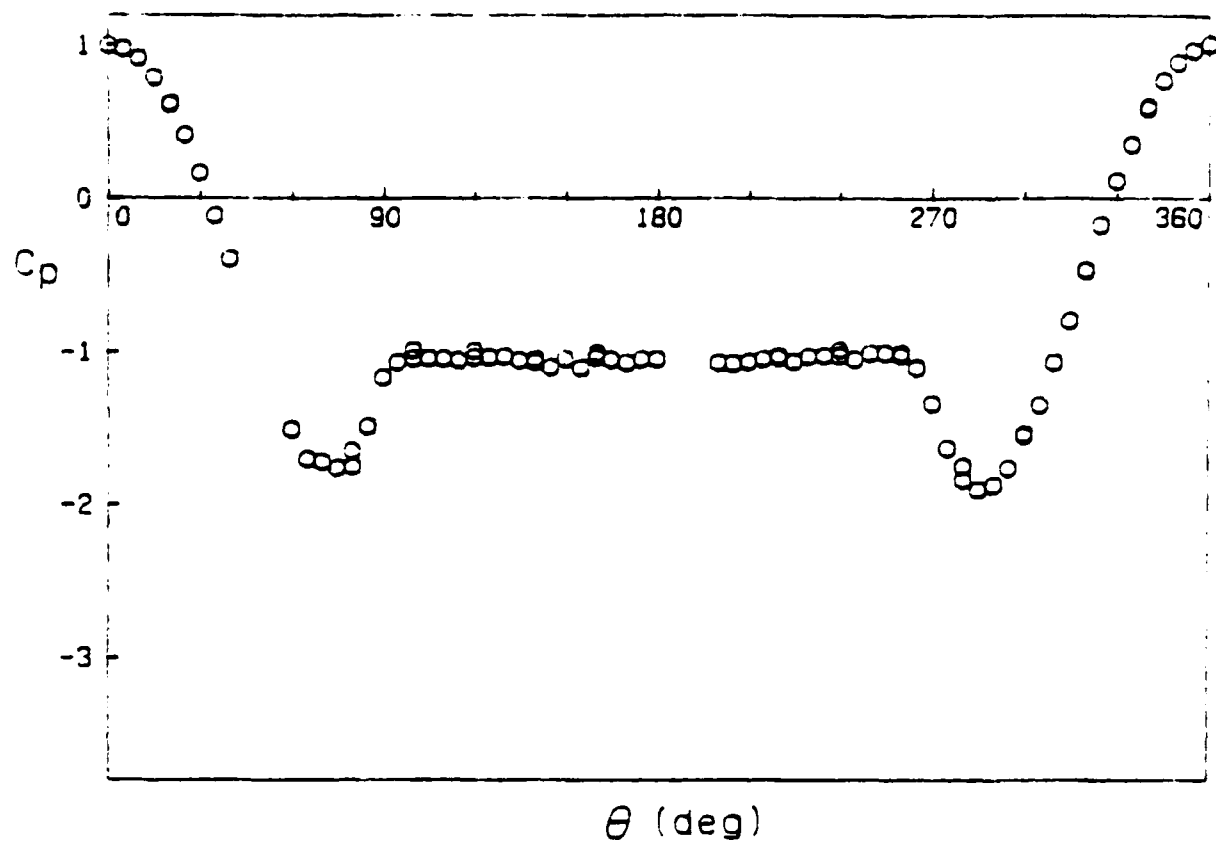
[ROUGH CYLINDER]

Re= 0.722 x10⁶   k/D= 0.0012   RUN ID= 229
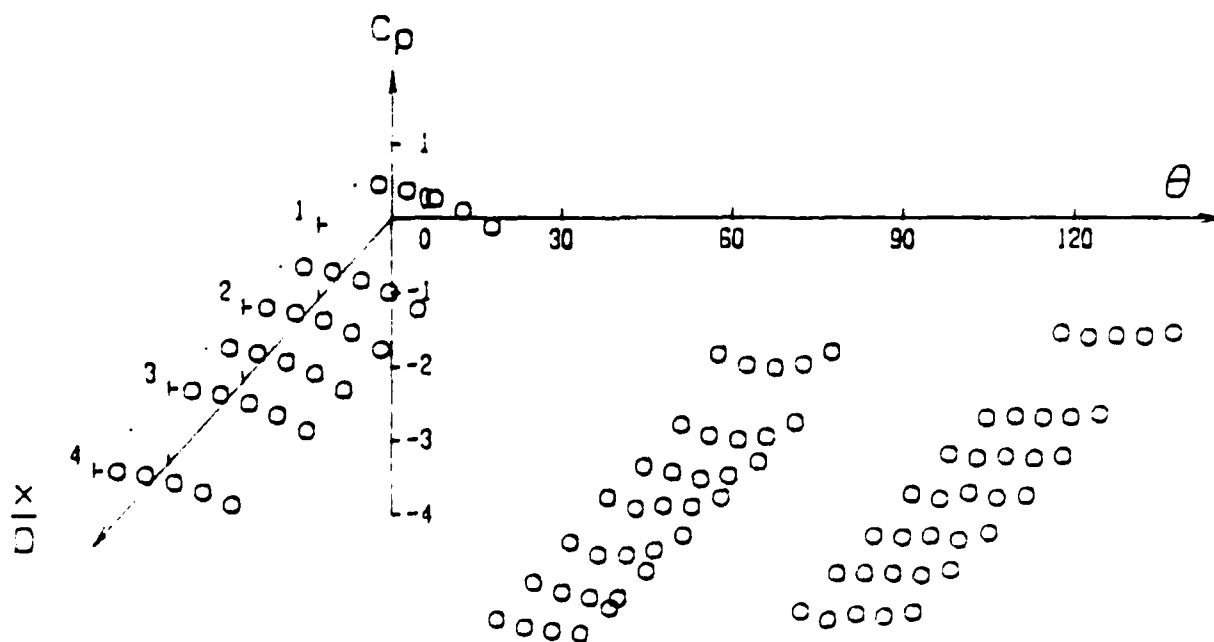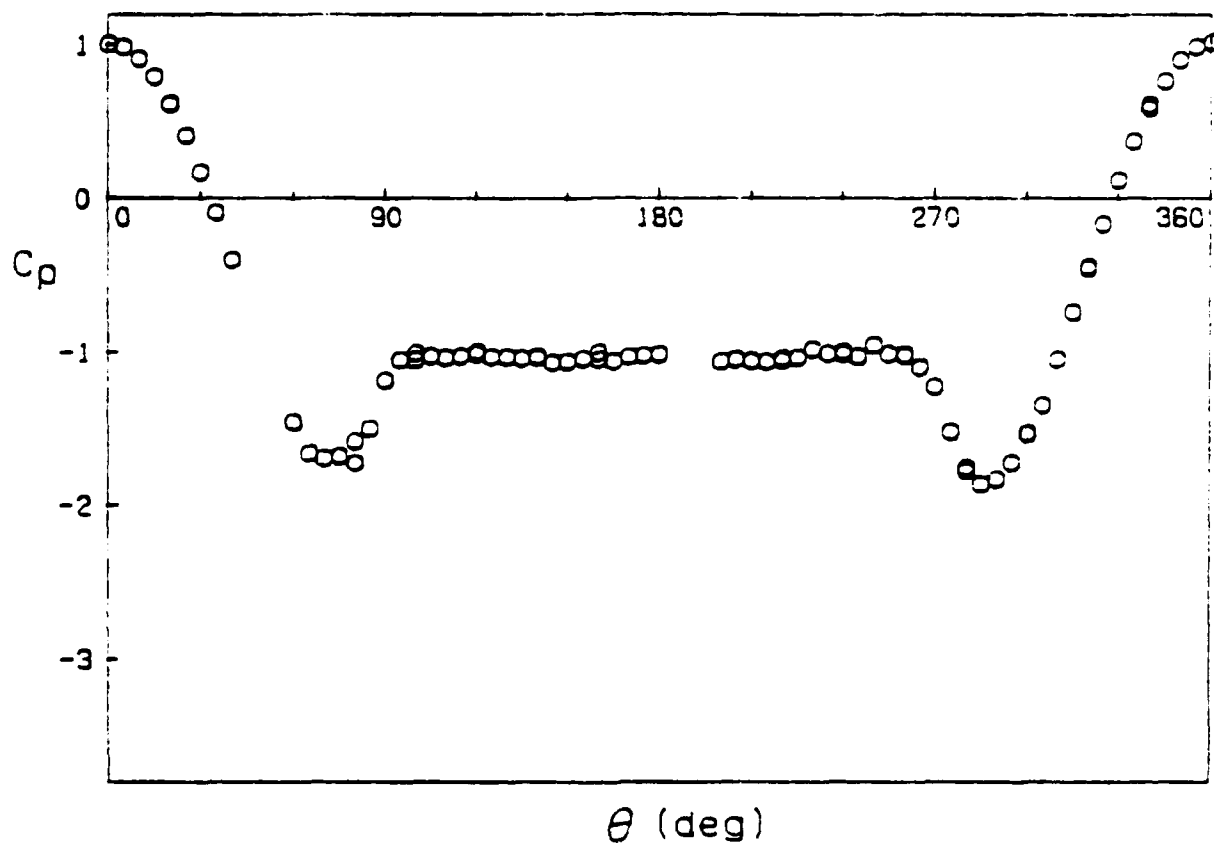
[ROUGH CYLINDER]

Re= 0.829 ×10^6 k/D= 0.0012   RUN ID= 230

θ (deg)
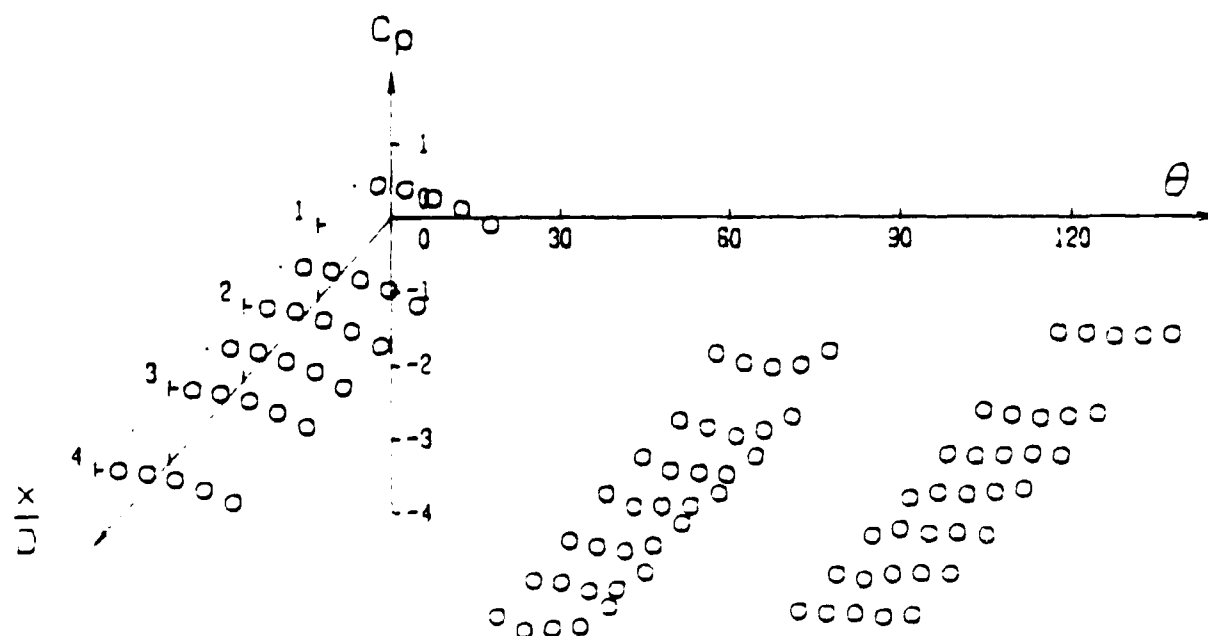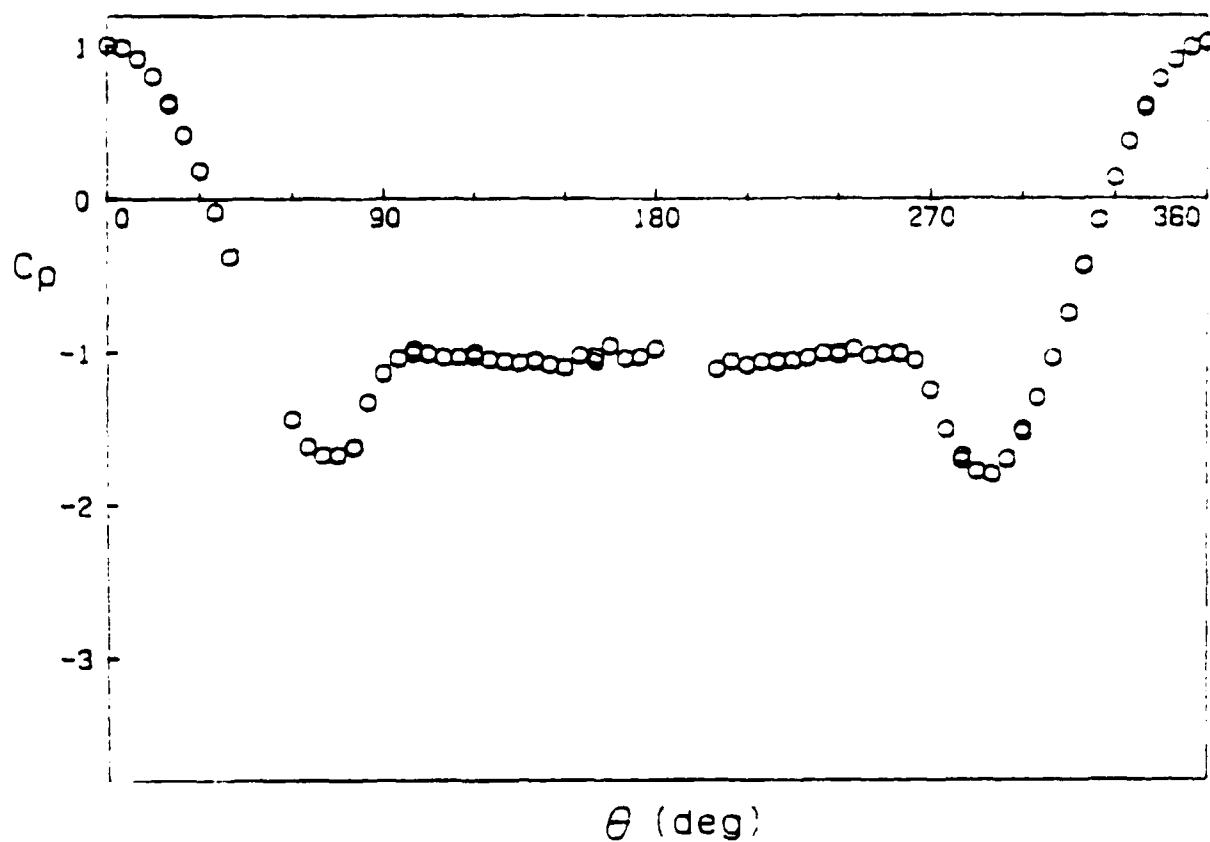
[ROUGH CYLINDER]

Re= 0.925 x10^6 K/D= 0.0012   RUN ID= 23.
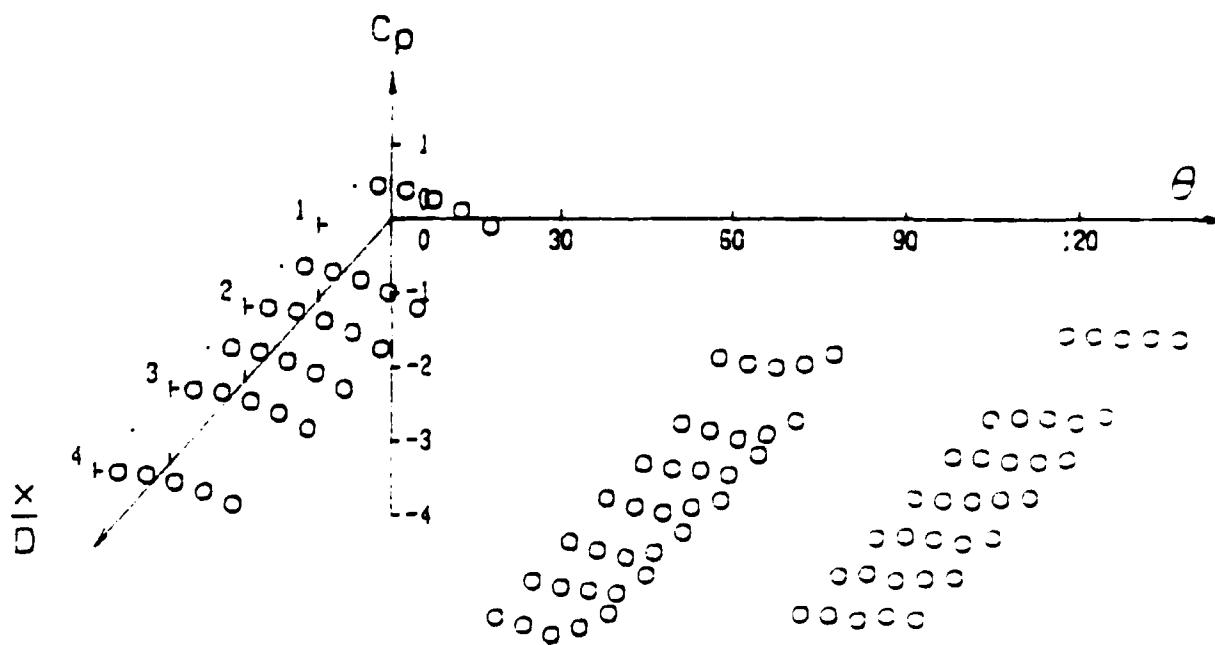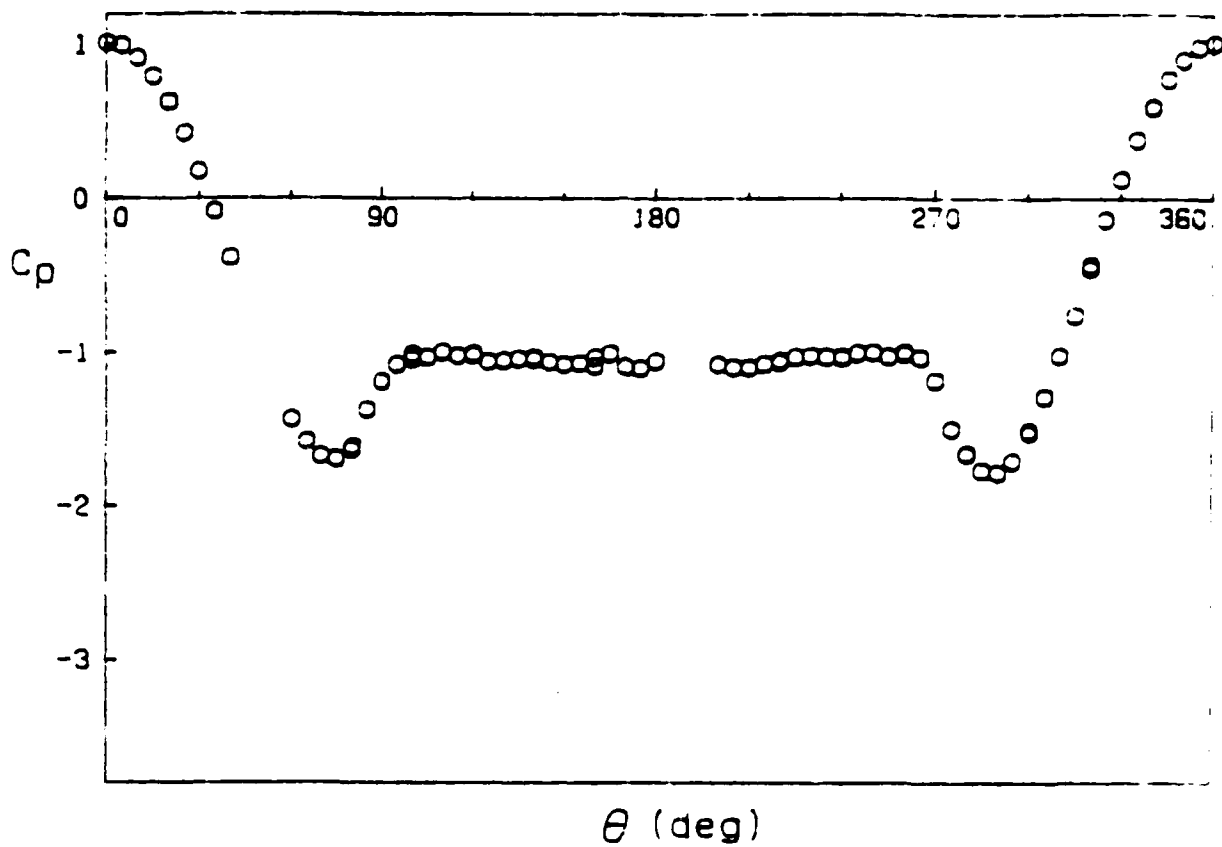
[ROUGH CYLINDER]

Re= 1.027 x10⁶   k/D= 0.0012   RUN ID= 232

θ (deg)
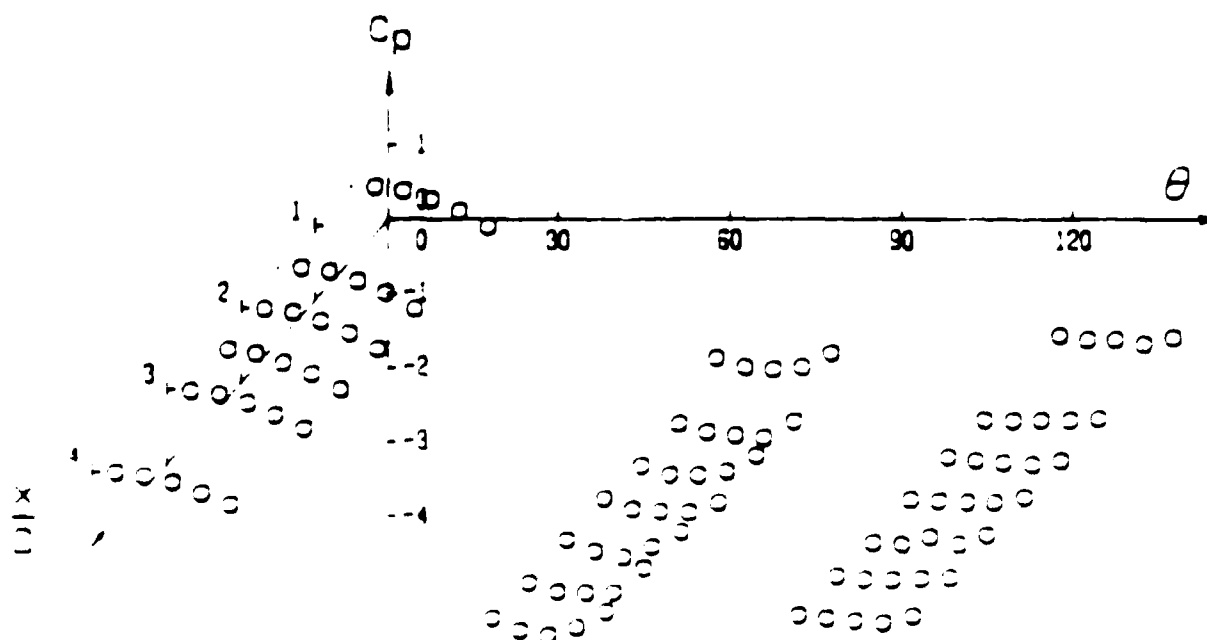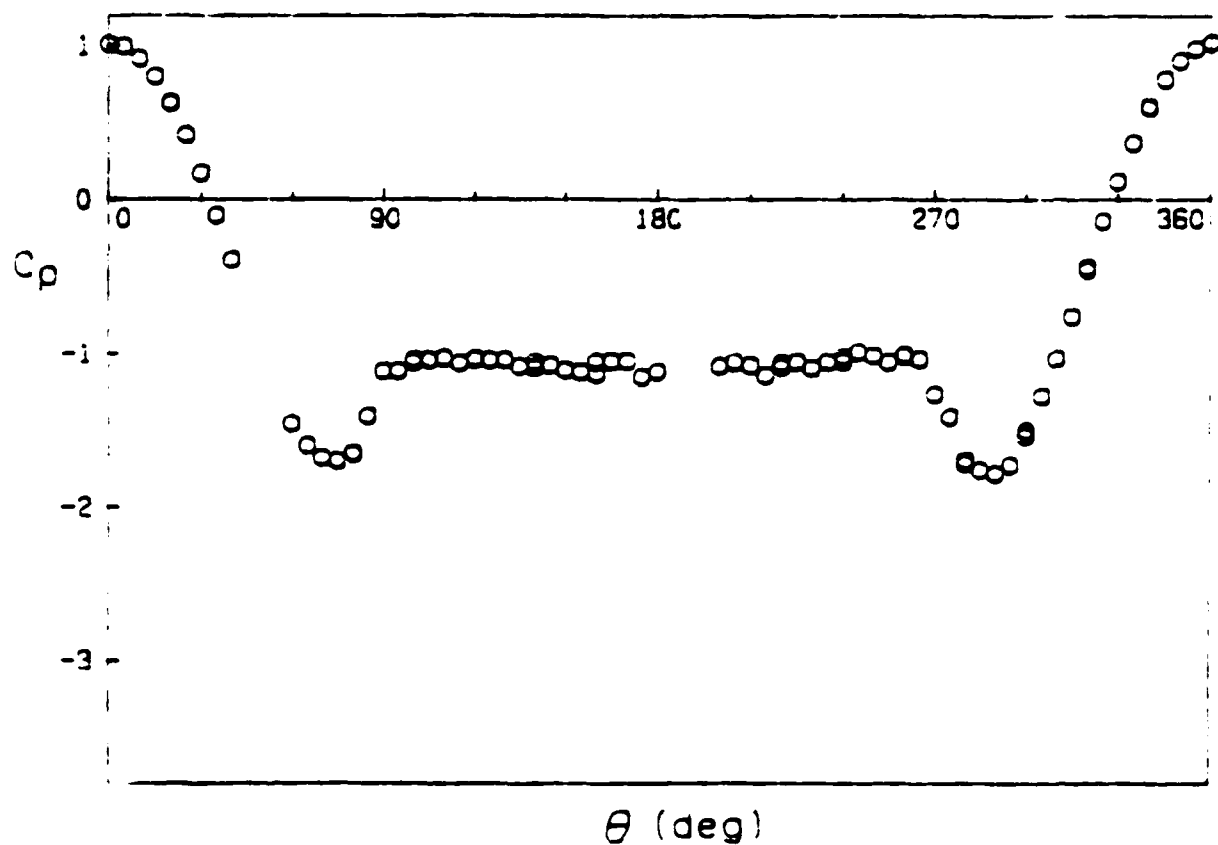
[ROUGH CYLINDER]

Re= 1.277 x10⁶   K/D= 0.0012   RUN ID= 233
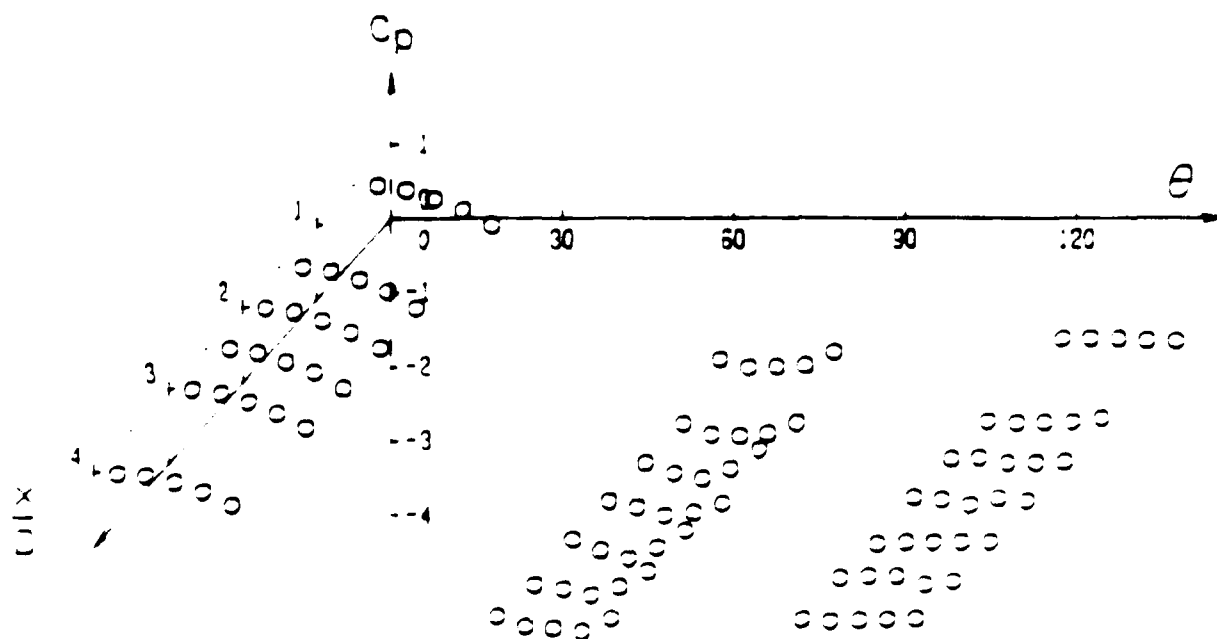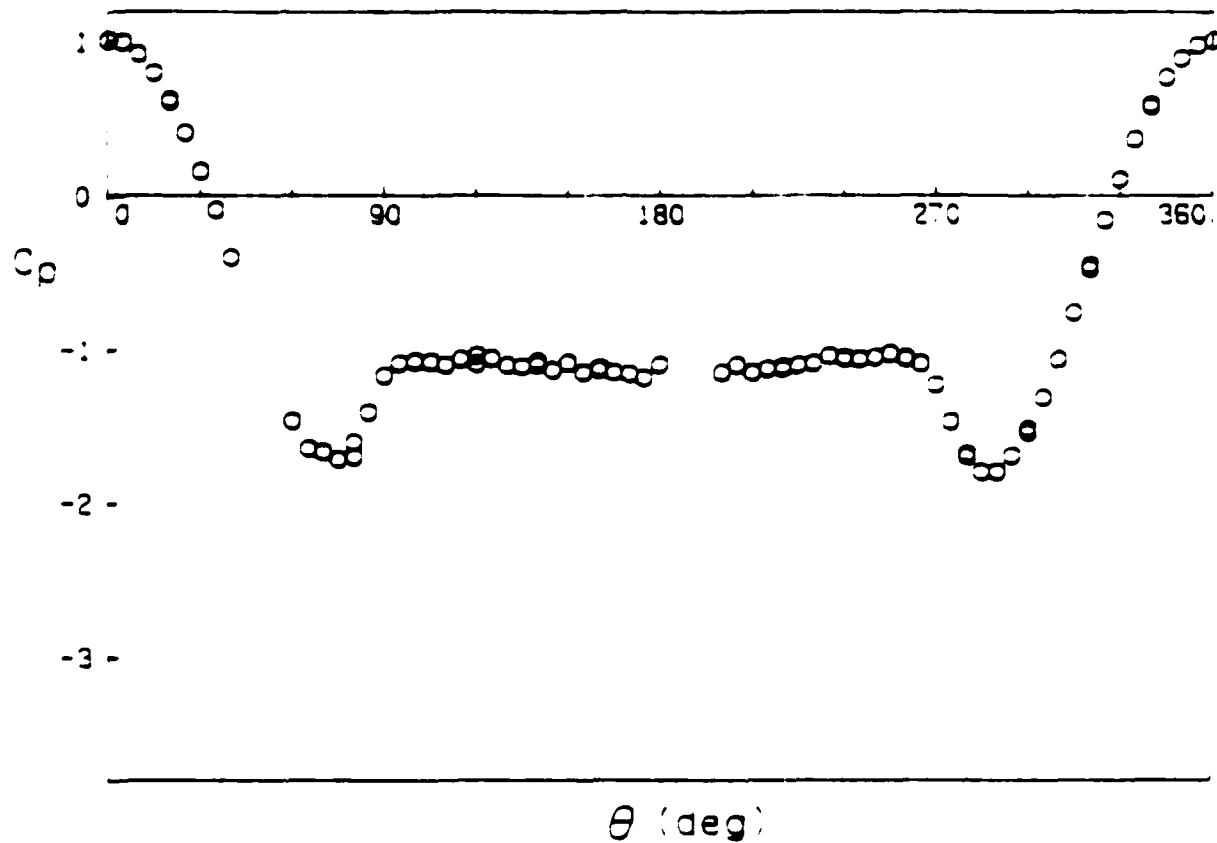
[ROUGH CYLINDER]

Re= 1.530 x10⁶   k/D= 0.0012   RUN ID= 234

θ (deg)
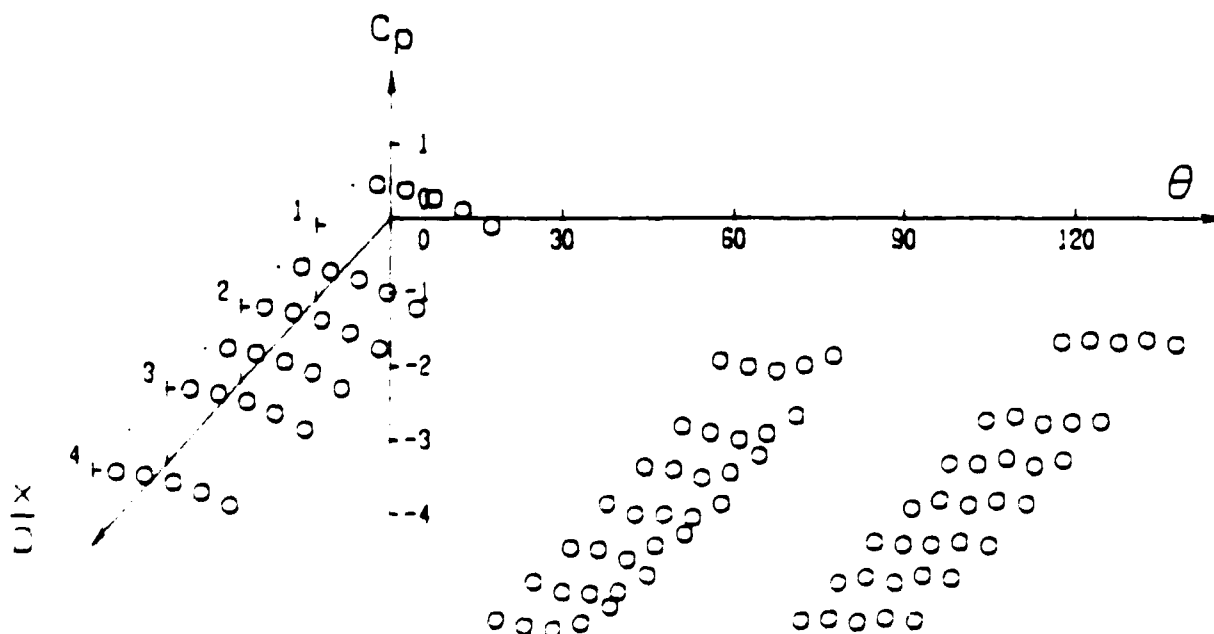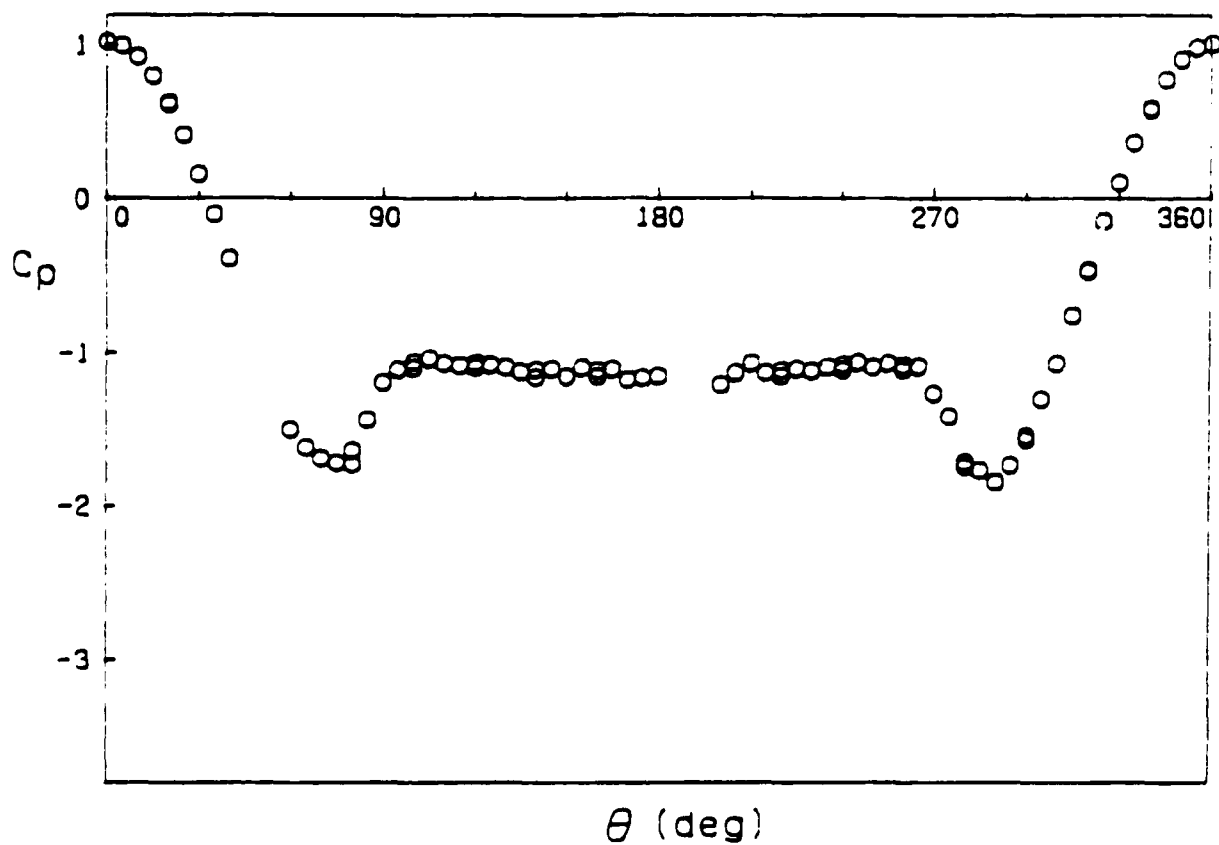
[ROUGH CYLINDER]

Re= 1.791 ×10⁶   k/D= 0.0012   RUN ID= 235

θ (deg)
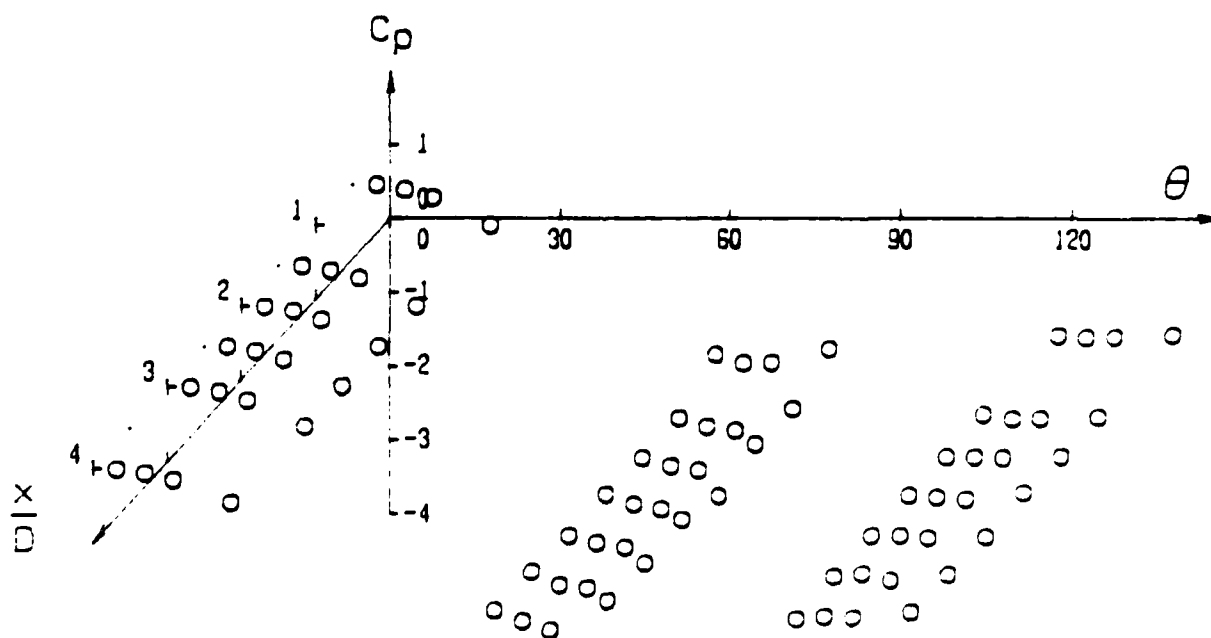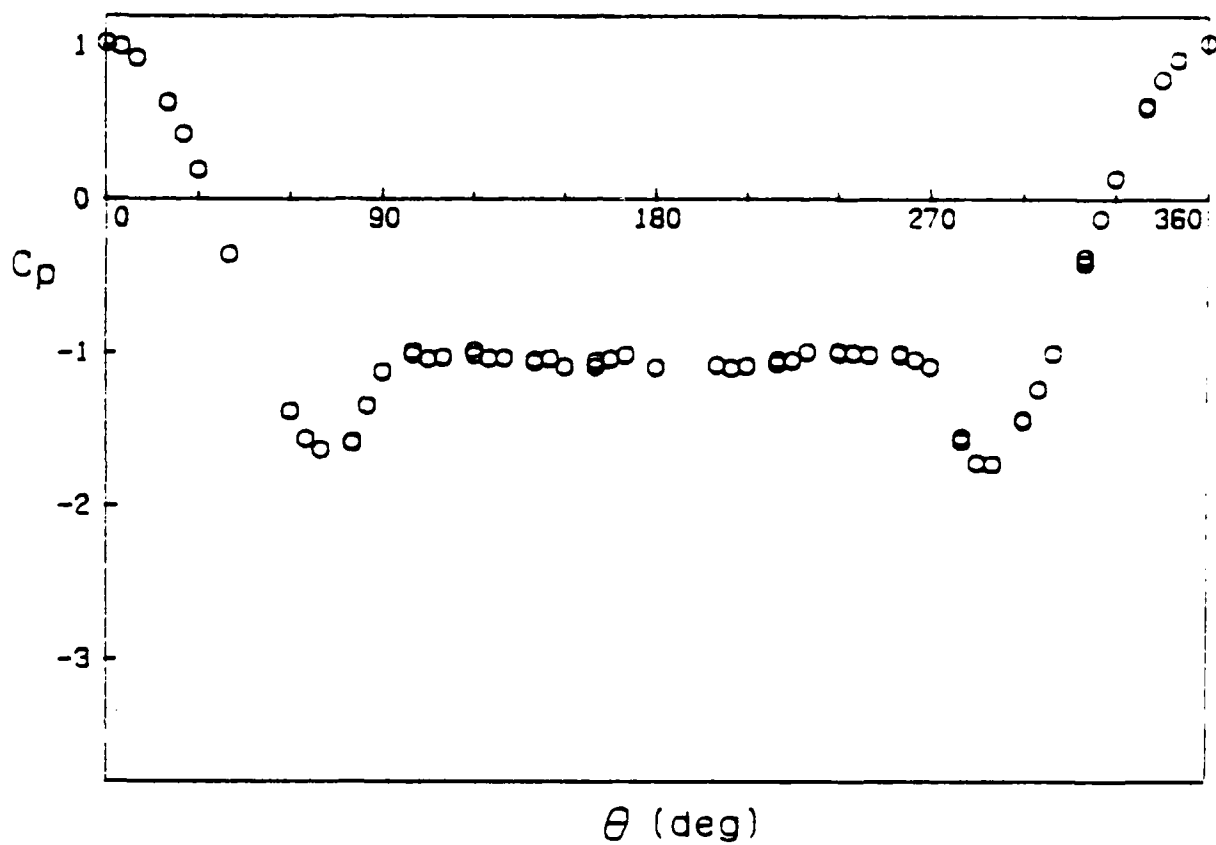
[ROUGH CYLINDER]

Re= 2.056 x10⁶   K/D= 0.0012   RUN ID= 236

θ (deg)
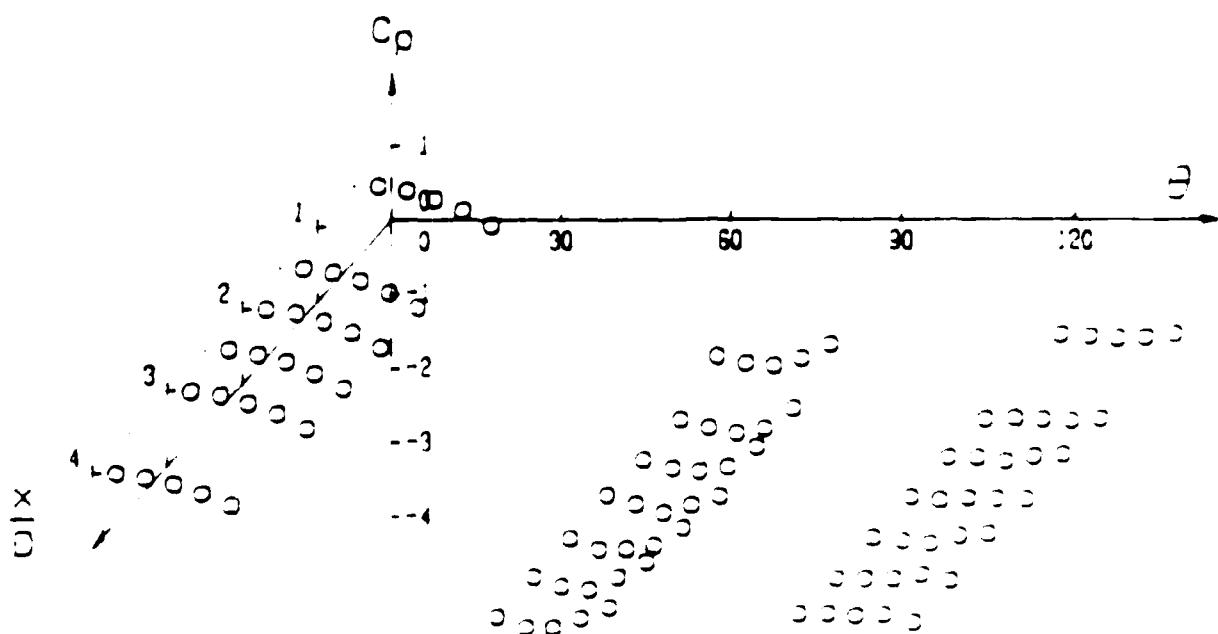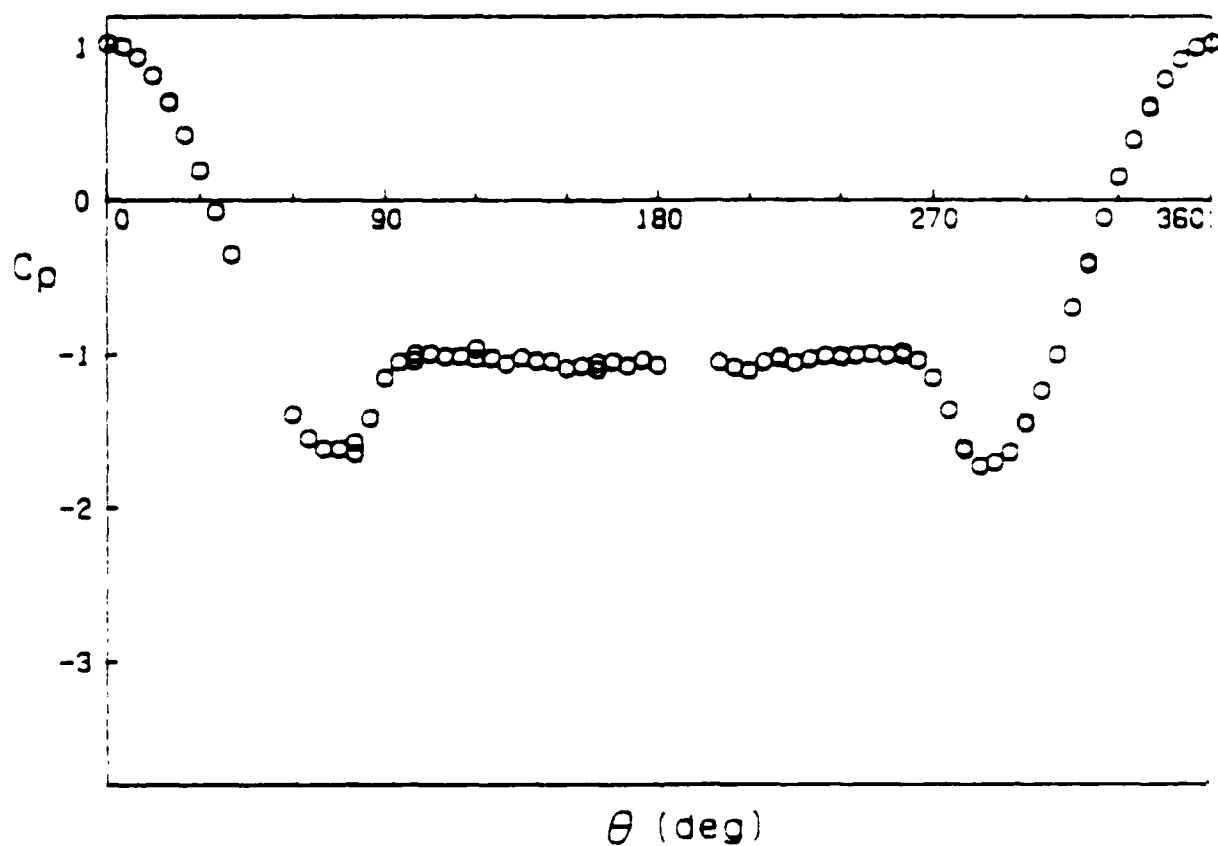
[ROUGH CYLINDER]

Re= 2.580 x10⁶   K/D= 0.0012   RUN ID= 237

θ (deg)
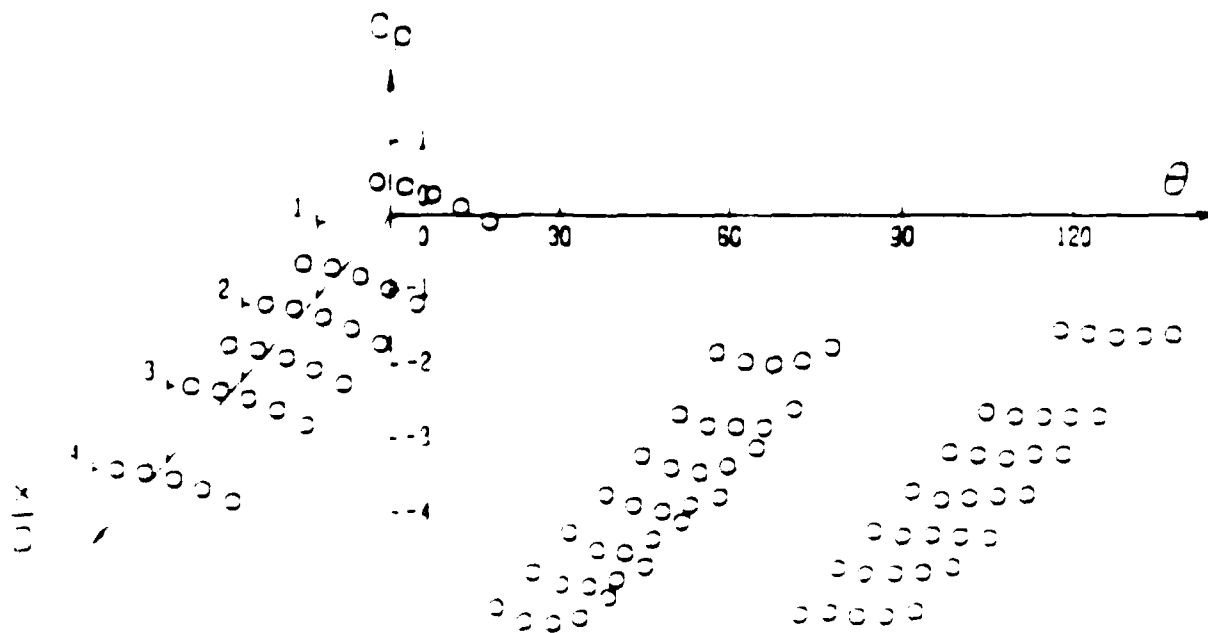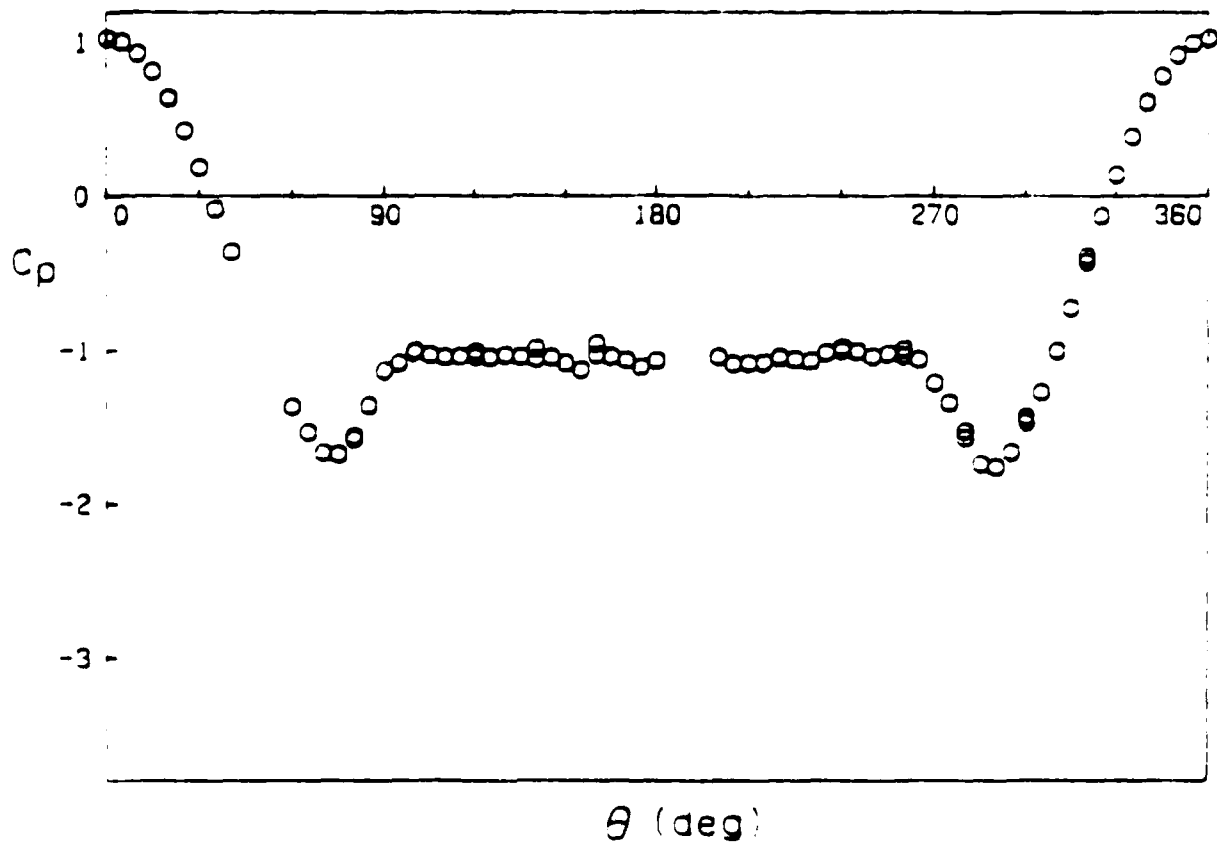
[ROUGH CYLINDER]

Re= 3.089 x10⁶   k/D= 0.0012   RUN ID= 238
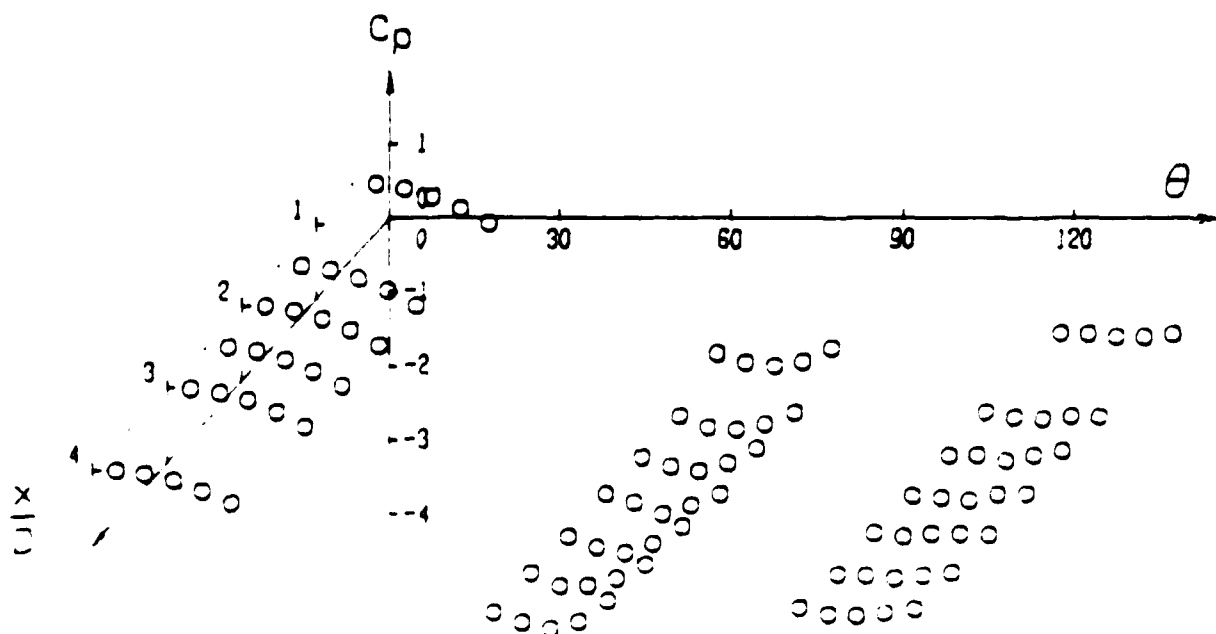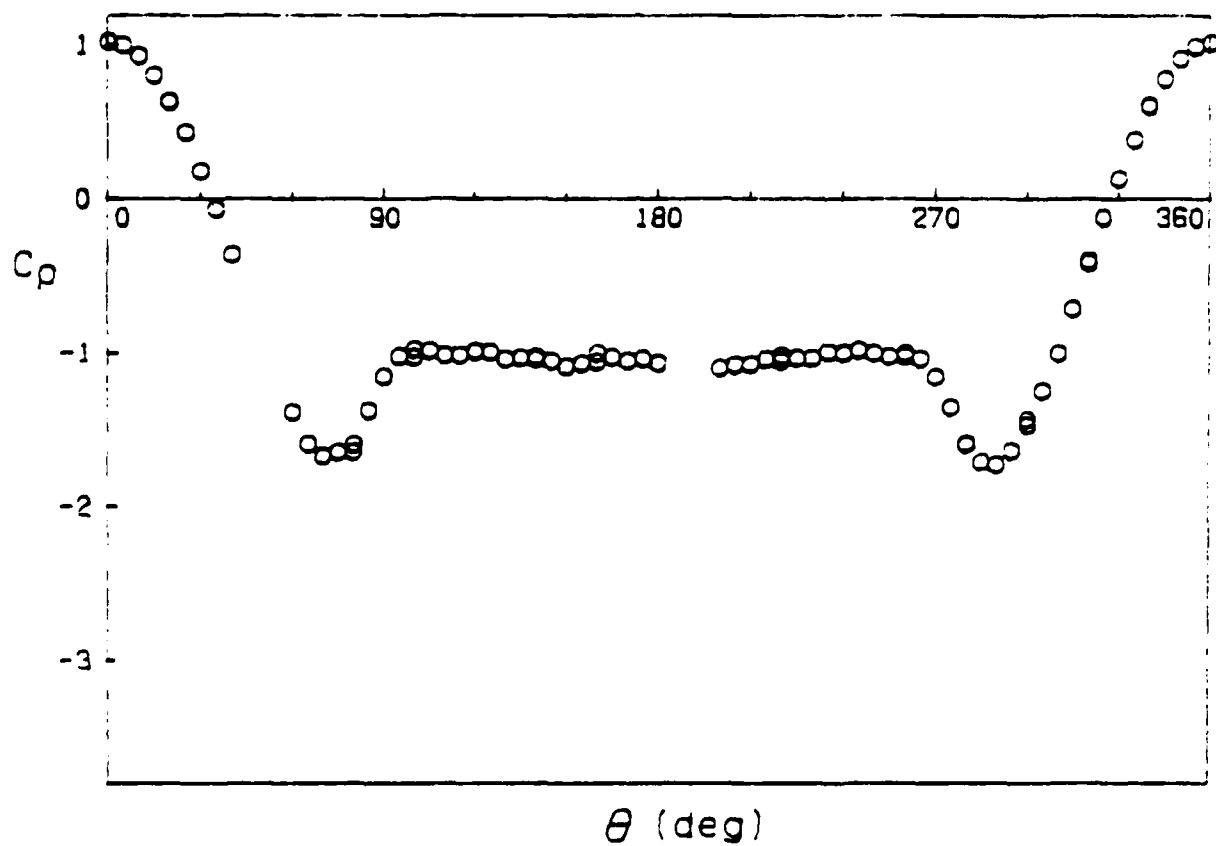
[ROUGH CYLINDER]

Re= 3.595 x10⁶   K/D= 0.0012   RUN ID= 239

θ (deg)
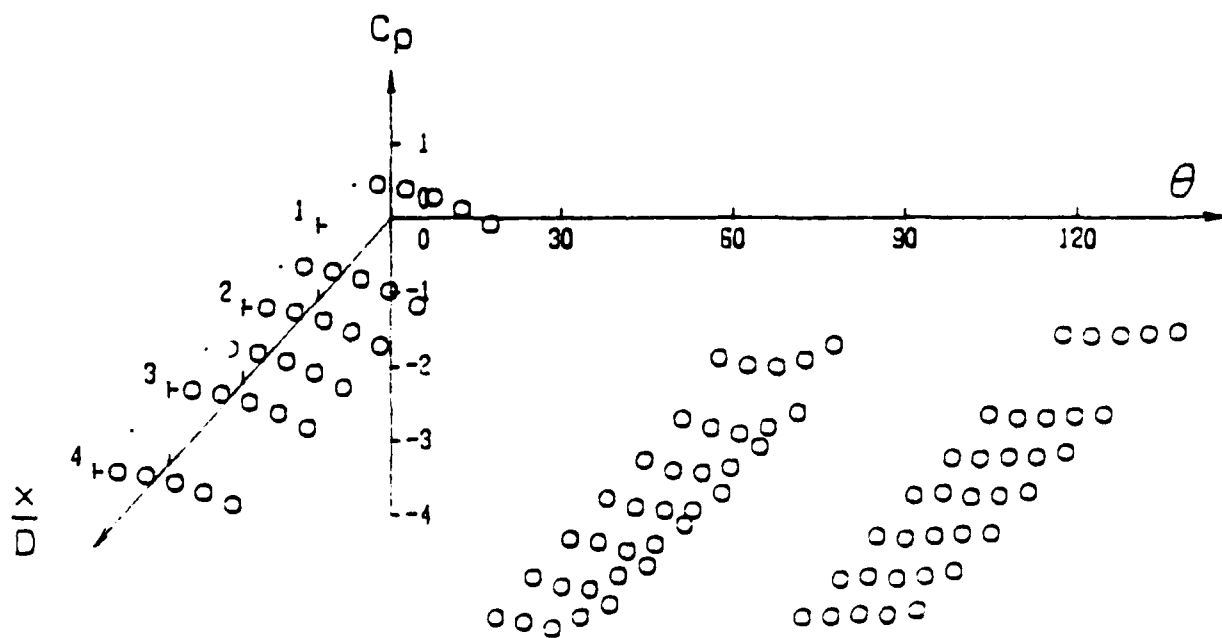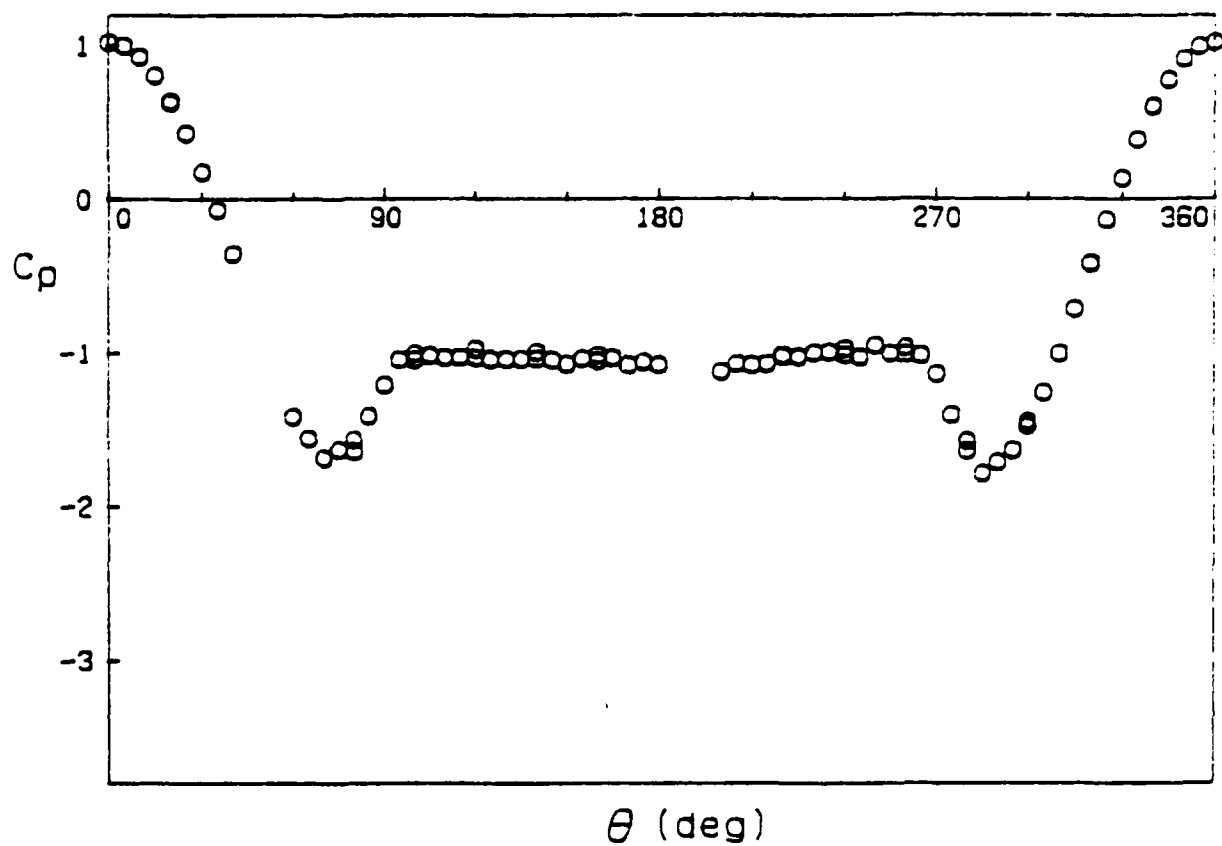
[ROUGH CYLINDER]

Re= 4.114 x10⁶   K/D= 0.0012   RUN ID= 24C
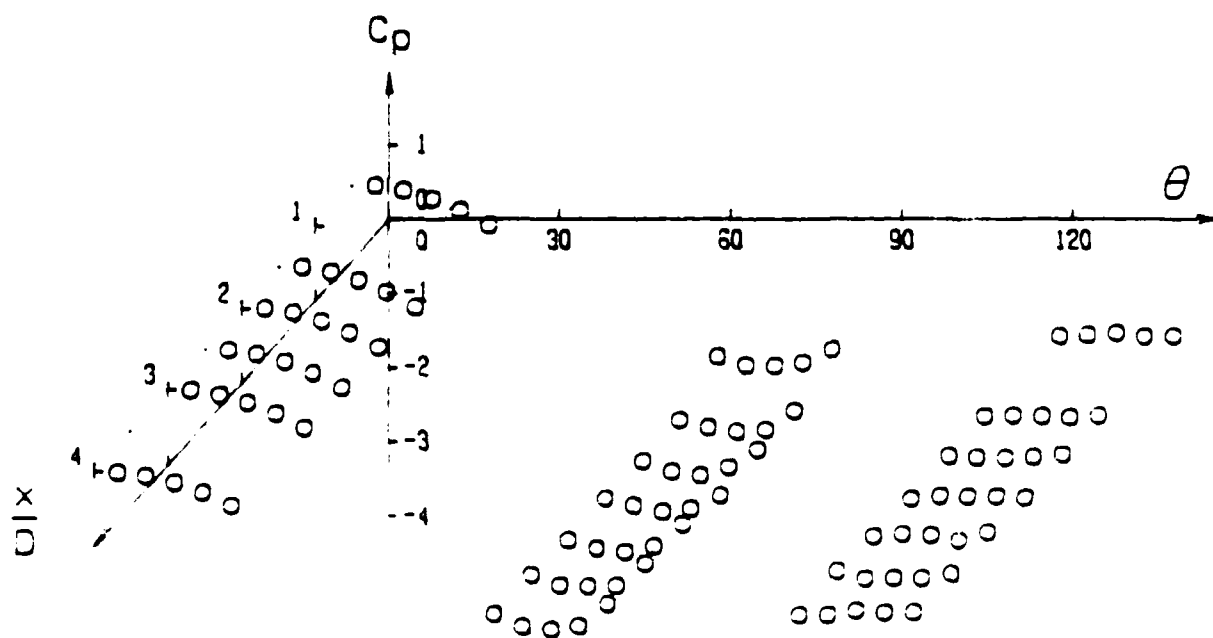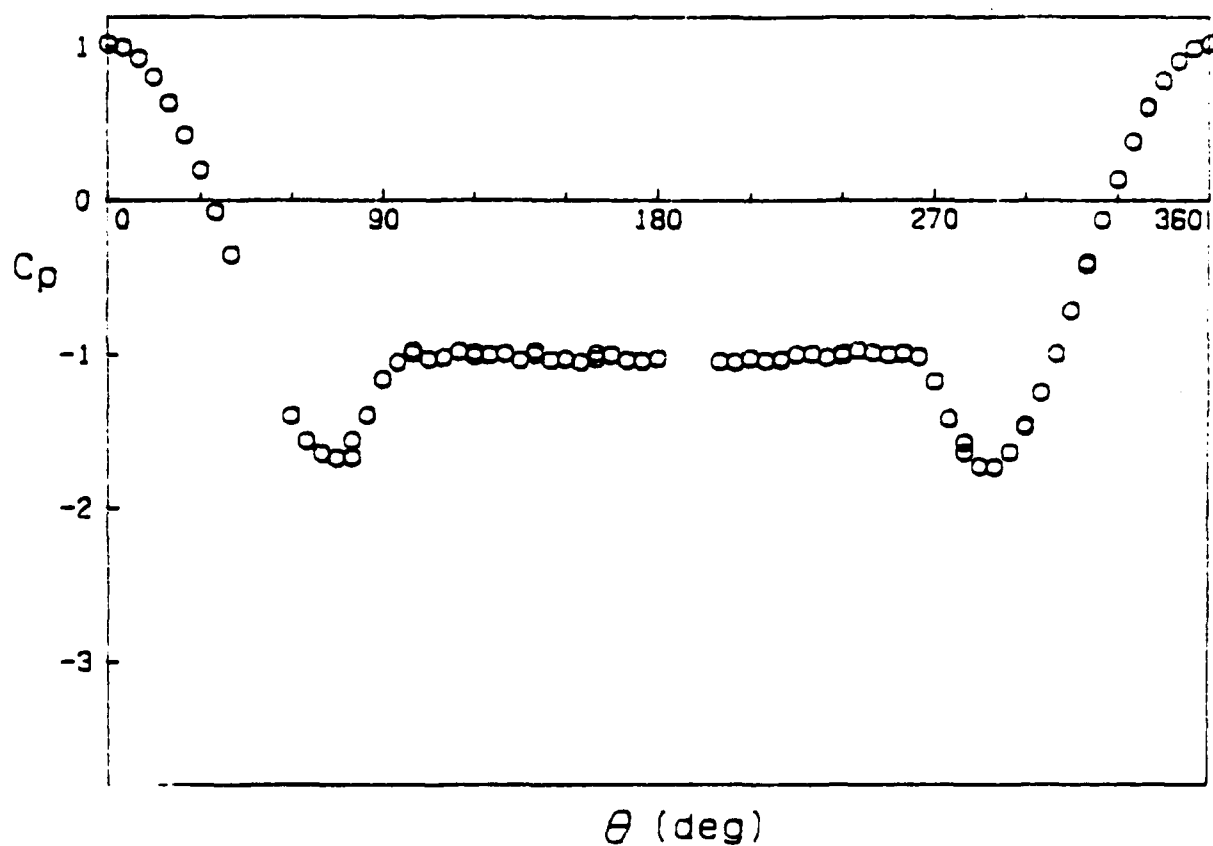
[ROUGH CYLINDER]

Re= 5.097 ×10⁶   K/D= 0.0012   RUN ID= 241

C_p

θ (deg)
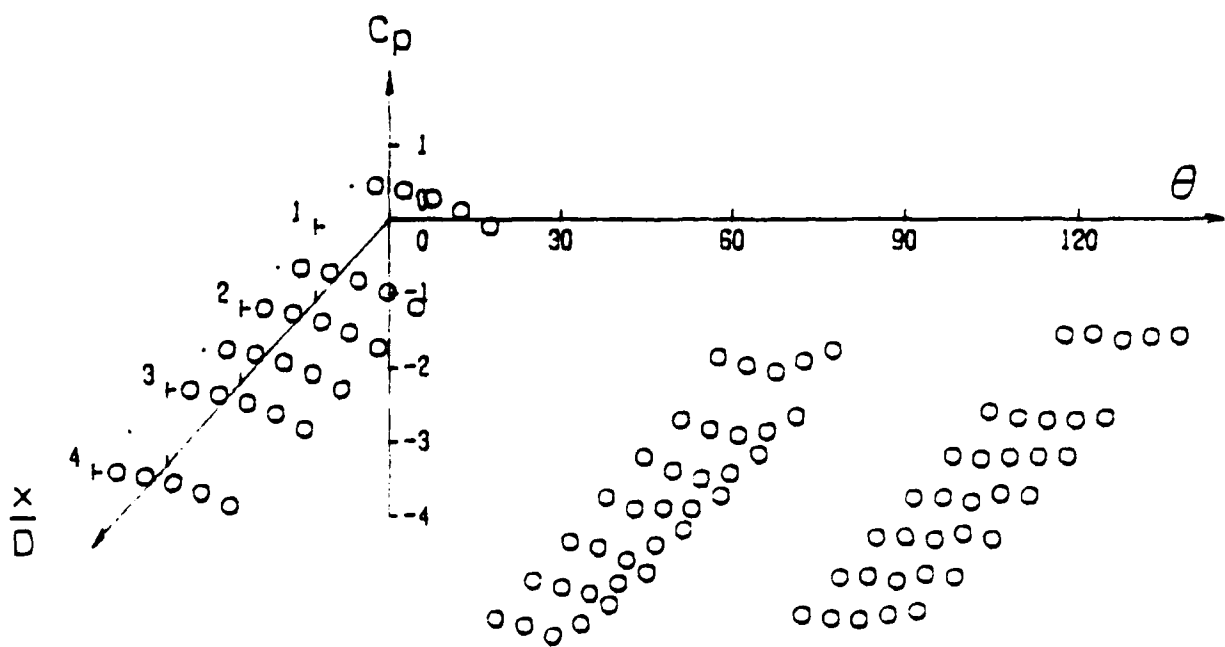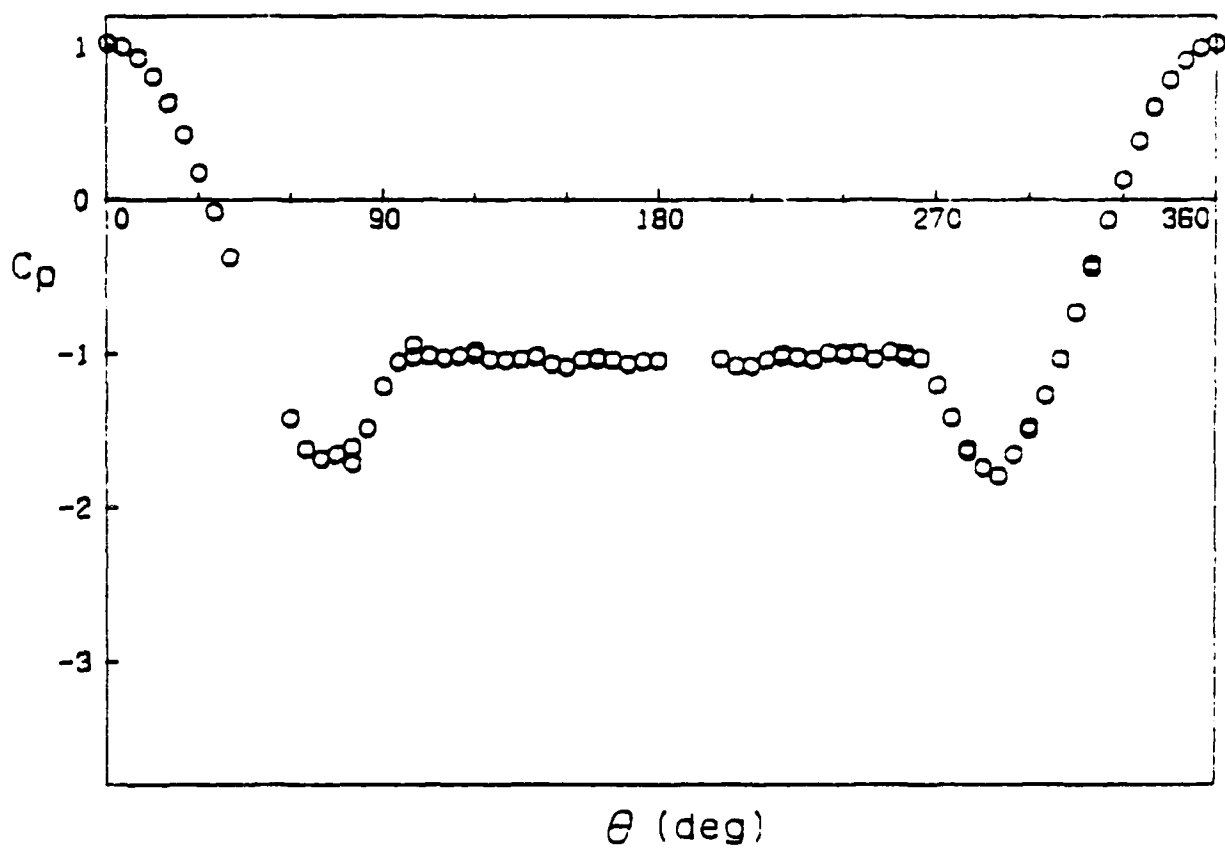
[ROUGH CYLINDER]

Re= 6.121 ×10⁶   K/D= 0.0012   RUN ID= 242

θ (deg)

:::-:
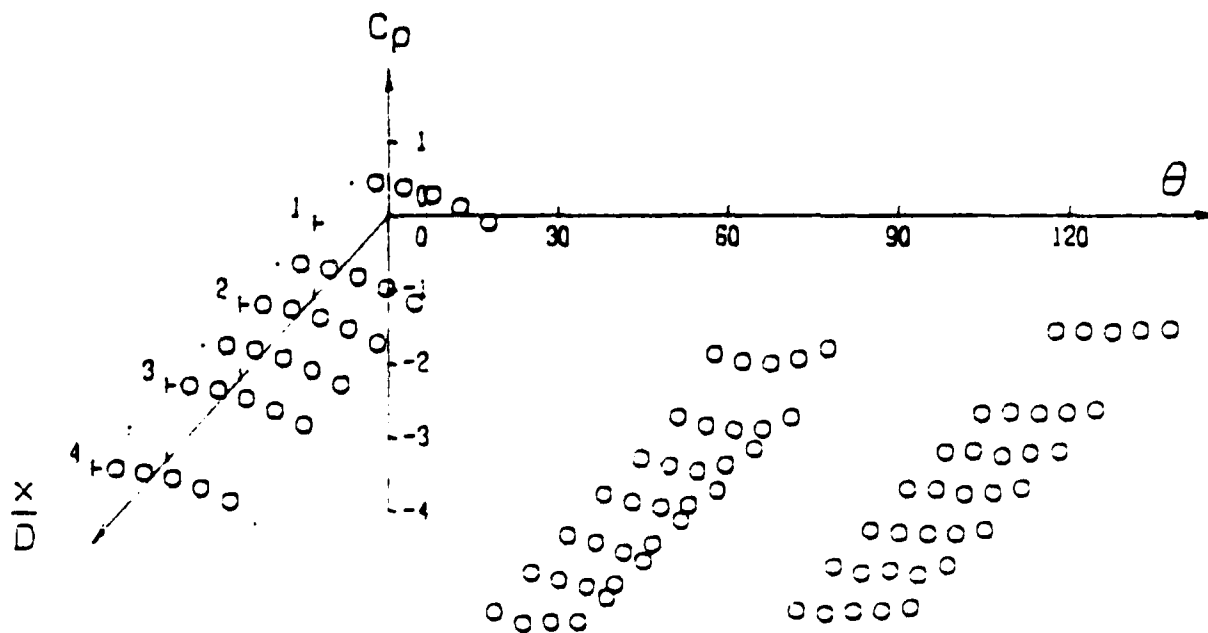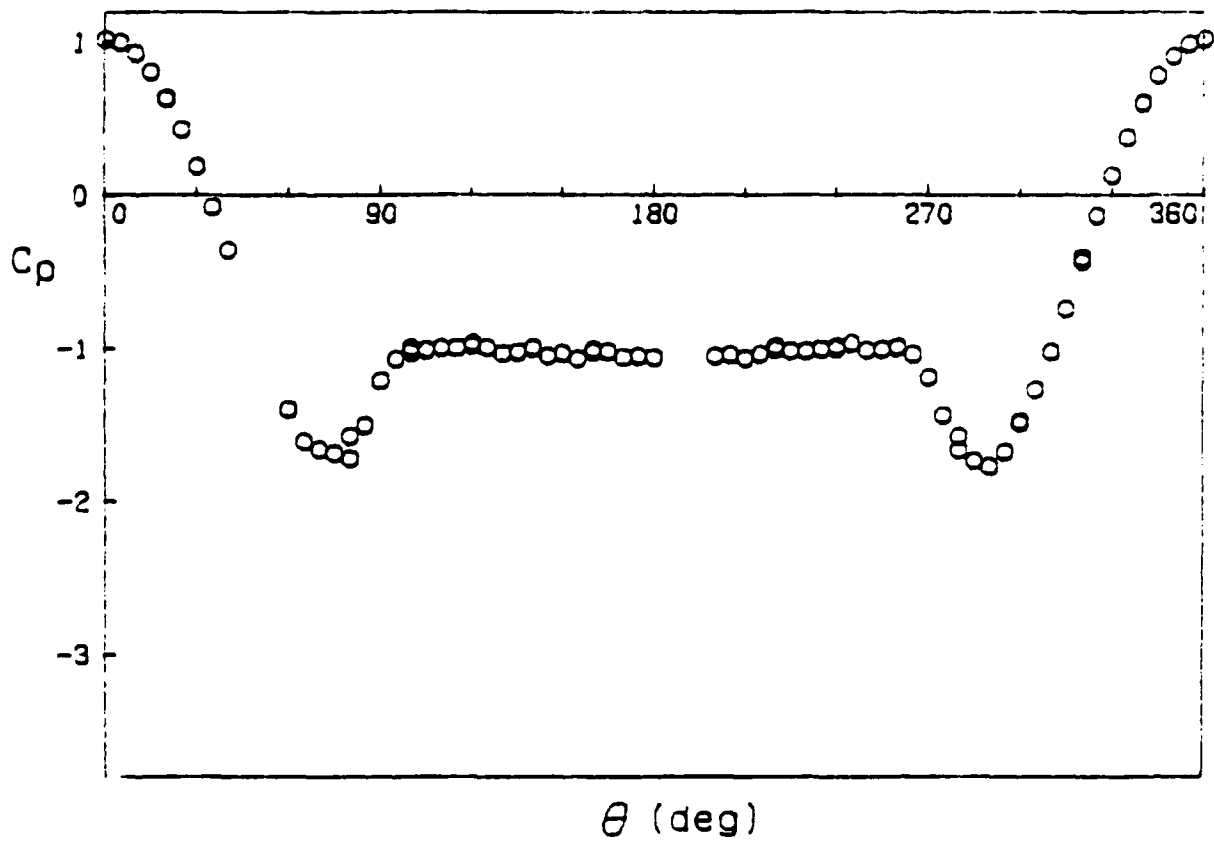
[ROUGH CYLINDER]

Re= 7.297 x10⁶   k/D= 0.0012   RUN ID= 243

θ (deg)
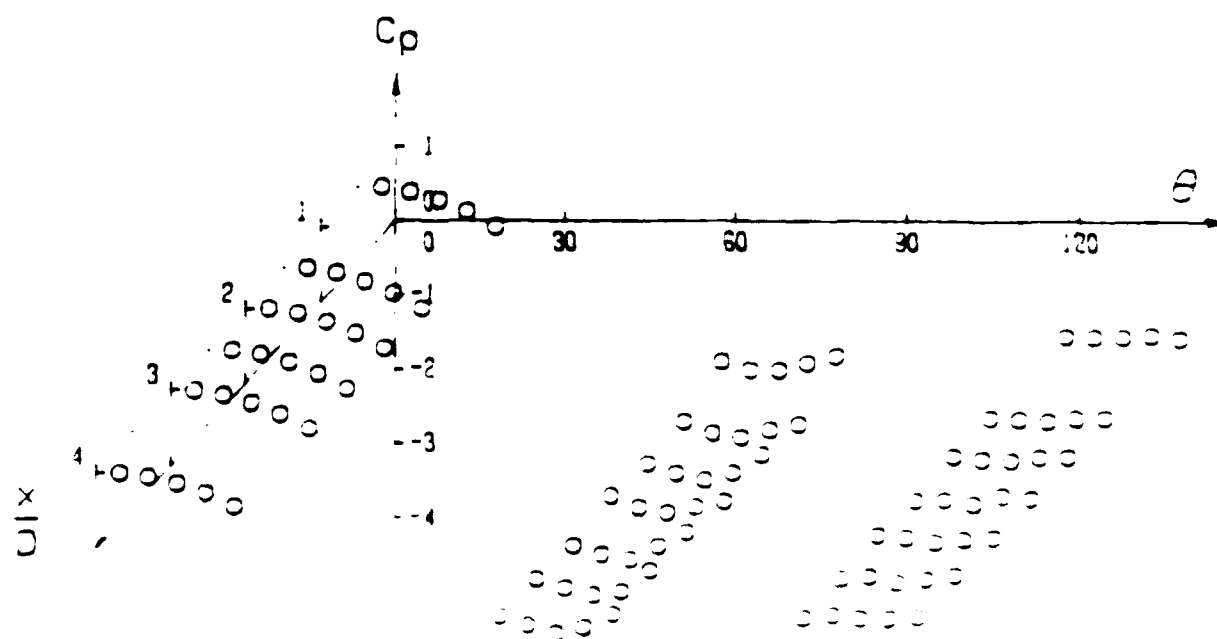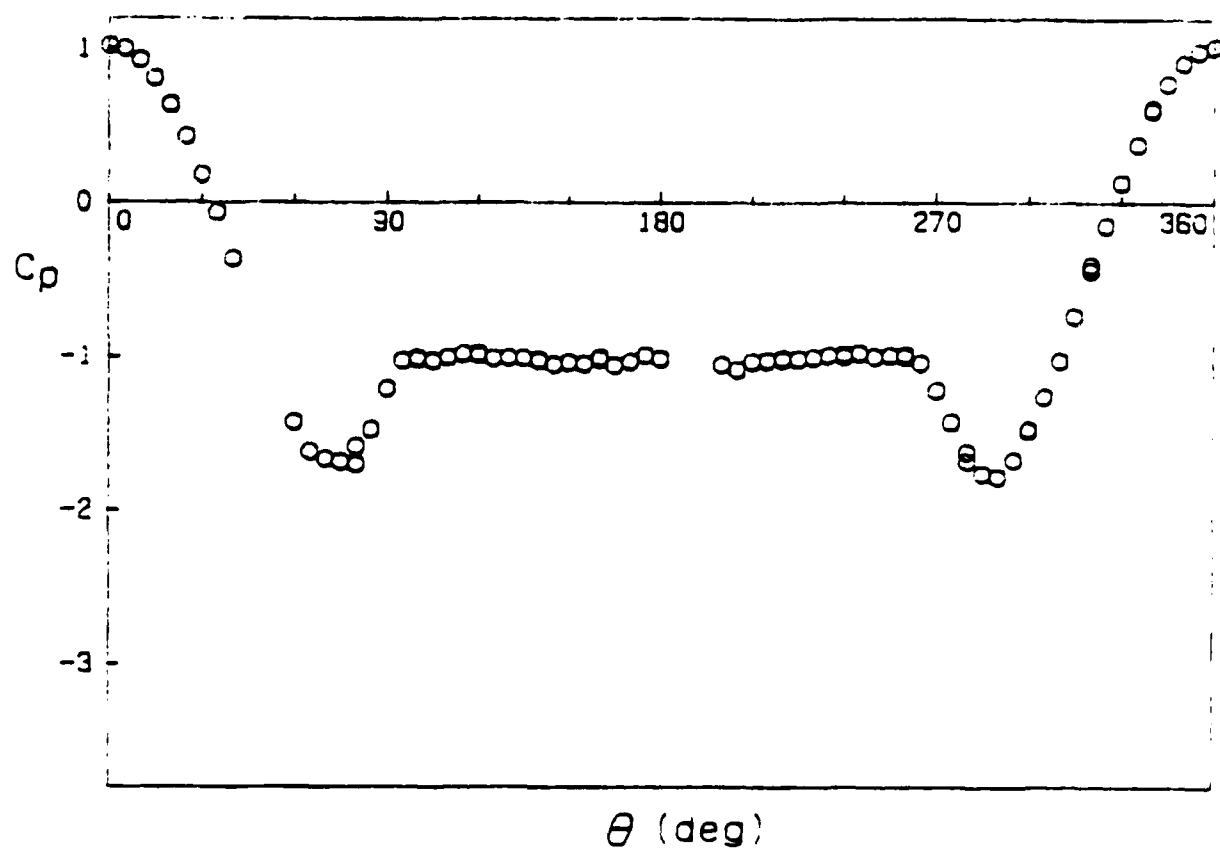
APPENDIX IV

PRESSURE DISTRIBUTION PLOTS - CONF4 ROUGH CYLINDER (k/D=0.01)

RUN ID	Re_D	C_d
142	0.42×10^6	1.128
143	0.51	1.142
144	0.62	1.149
145	0.73	1.157
146	0.82	1.136
147	0.95	1.149
148	1.06	1.123
140	1.29	1.061
139	1.54	1.036
137	2.06	1.068
152	2.13	1.004
136	2.54	1.048
135	3.05	1.043
153	3.52	0.993
134	4.19	1.051
154	4.21	1.001
133	5.11	1.055
155	5.22	1.013
156	6.14	1.044
132	6.39	1.061
157	6.71	1.058

[ROUGH CYLINDER]

Re= 0.415 x10⁶   κ/D= 0.0100   RUN ID= 142

θ (deg)
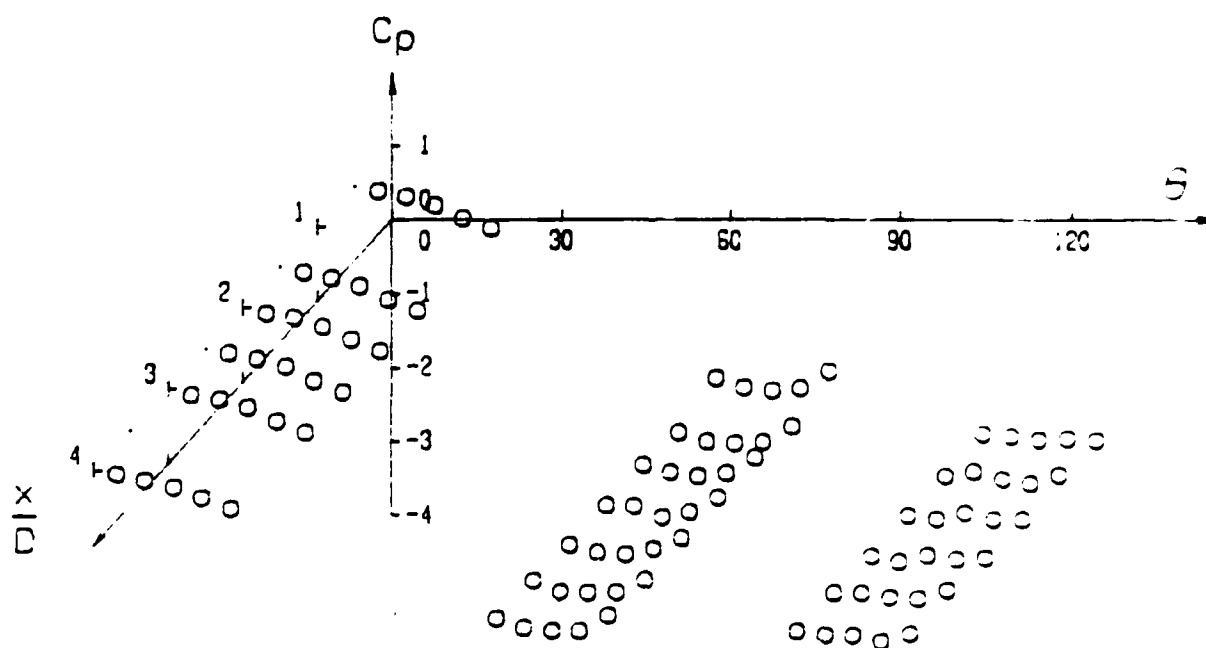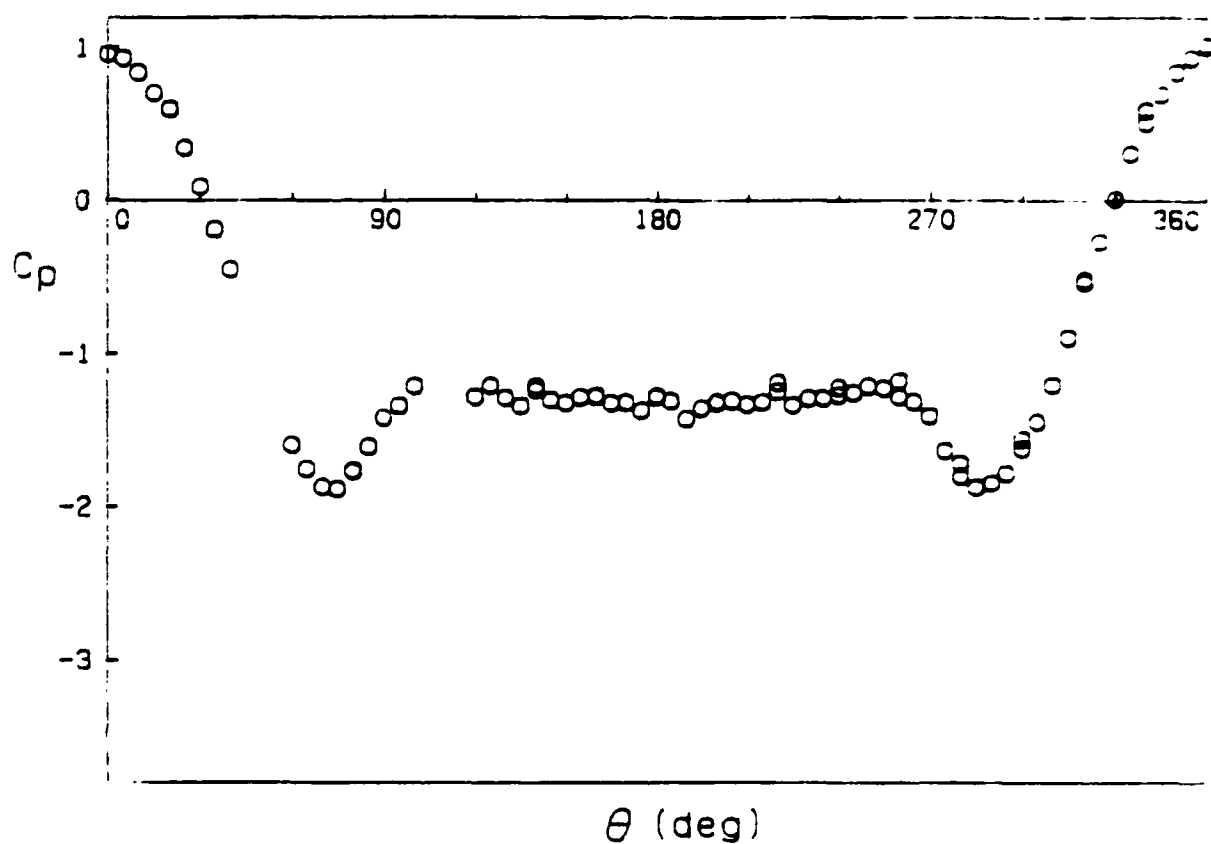
ROUGH CYLINDER

Re= 0.514 x10⁶   k/D= 0.0100   RUN ID= 143
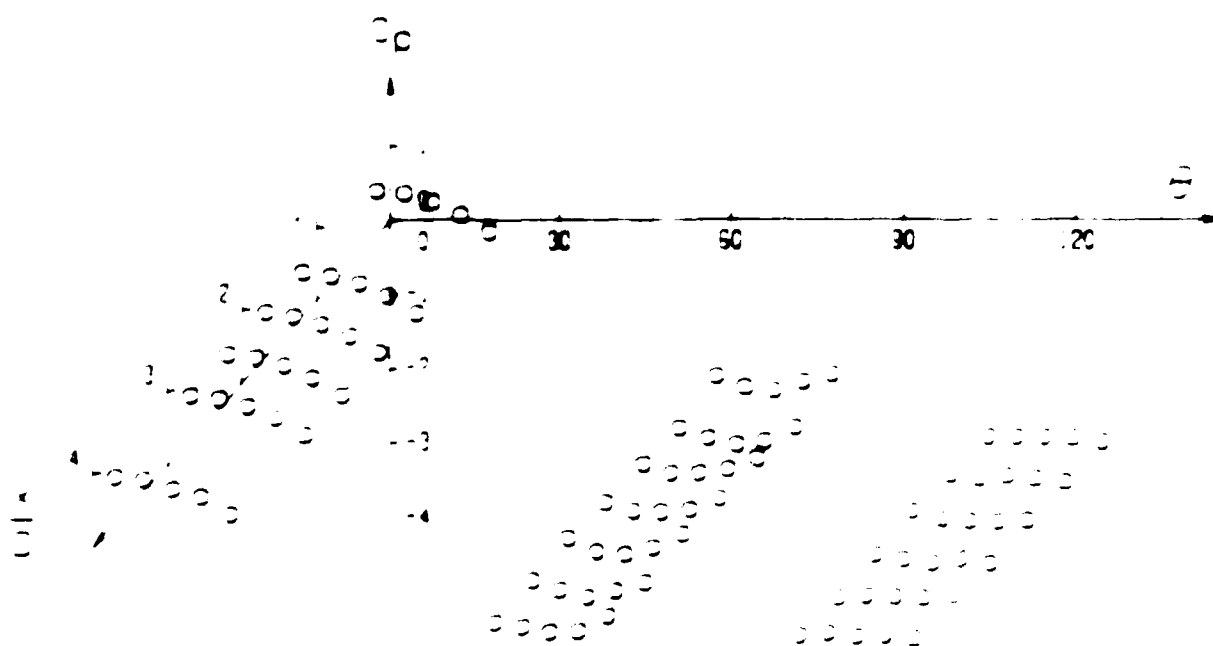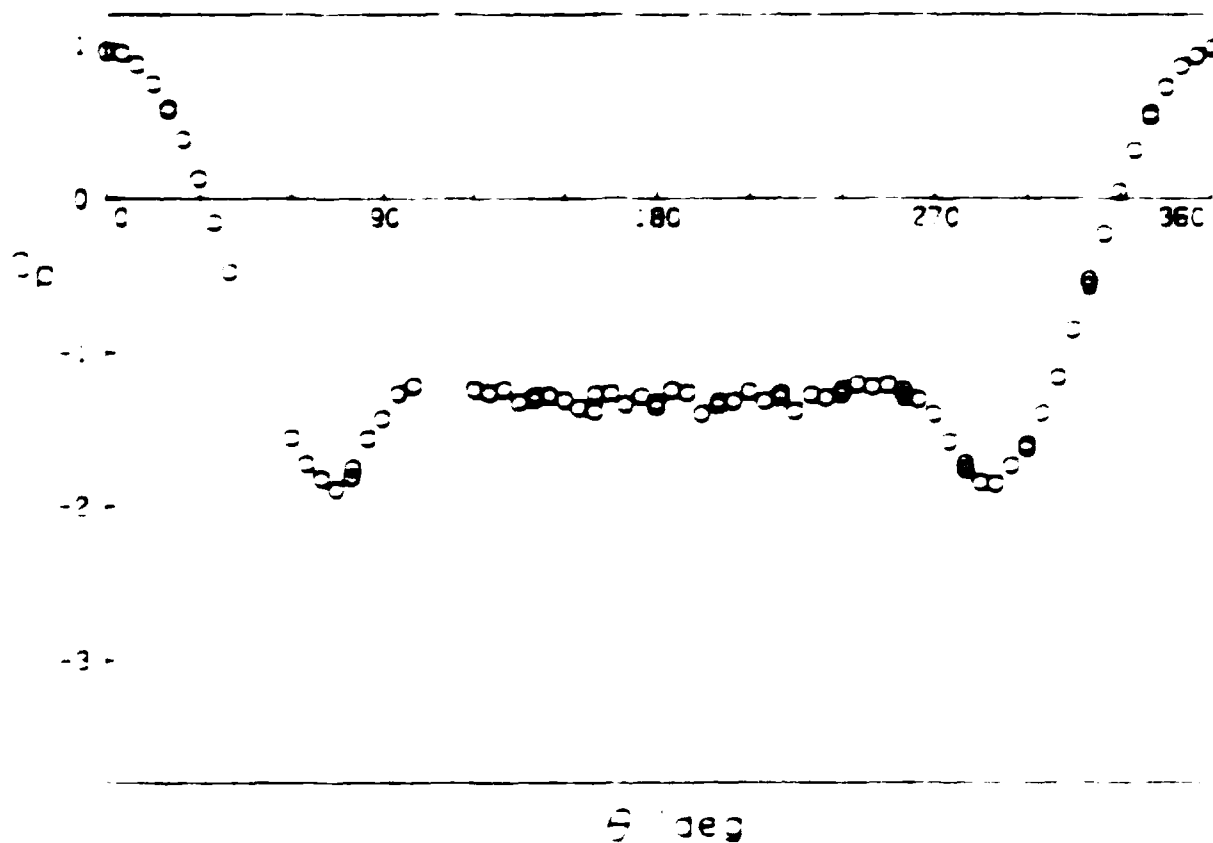
[ROUGH CYLINDER]

Re= 0.619 x10⁶   K/D= 0.0100   RUN ID= 144
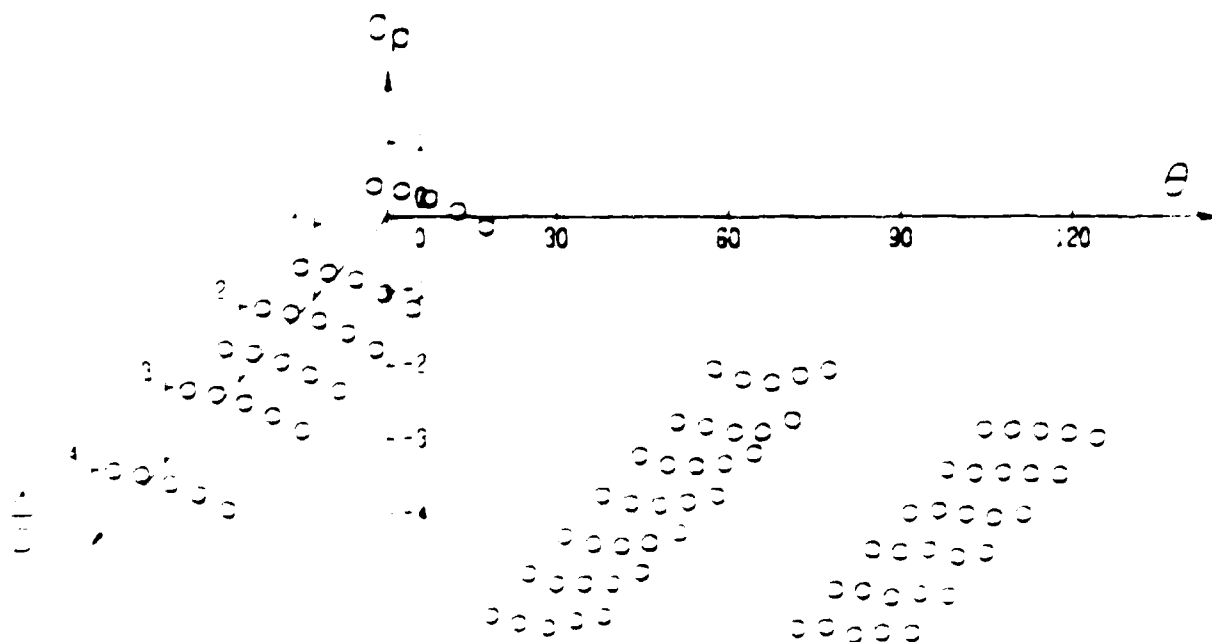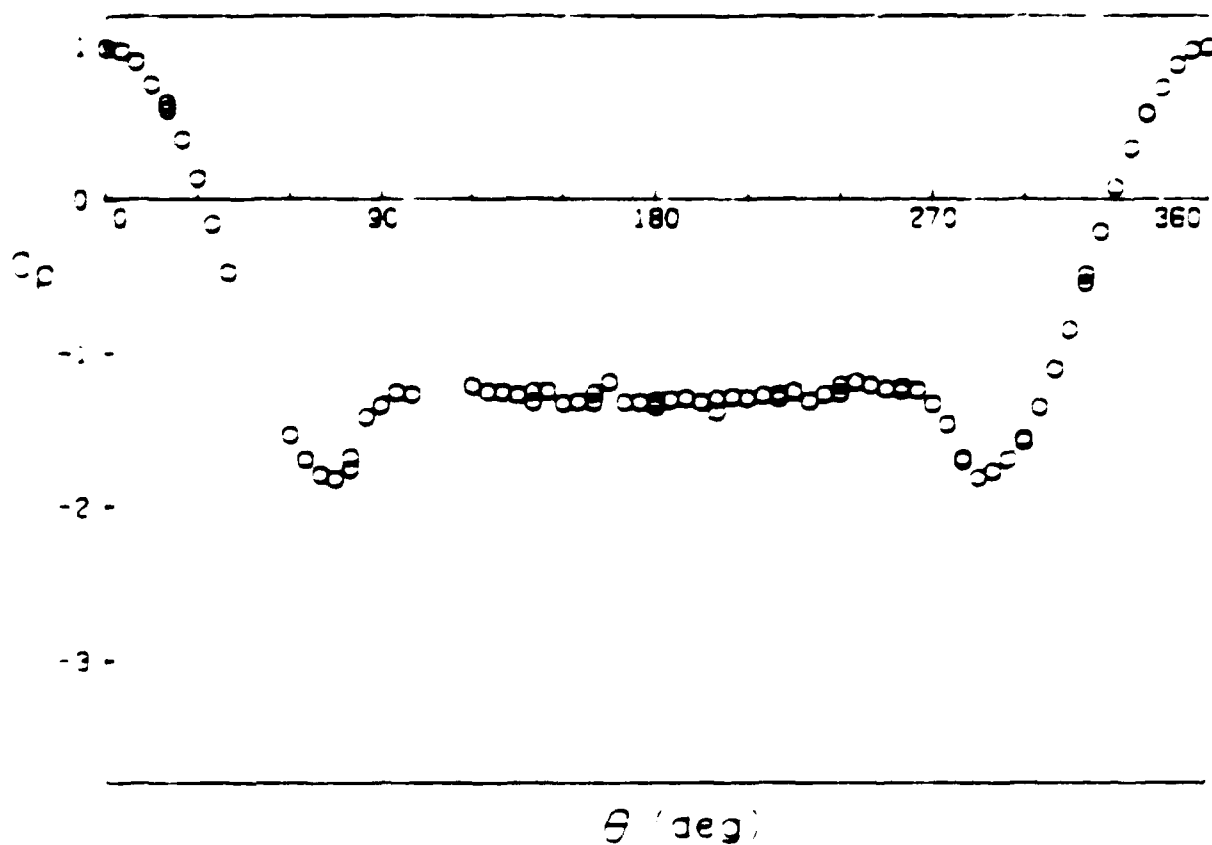
[ROUGH CYLINDER]

Re= 0.727 x10⁶   K/D= 0.0100   RUN ID= 145
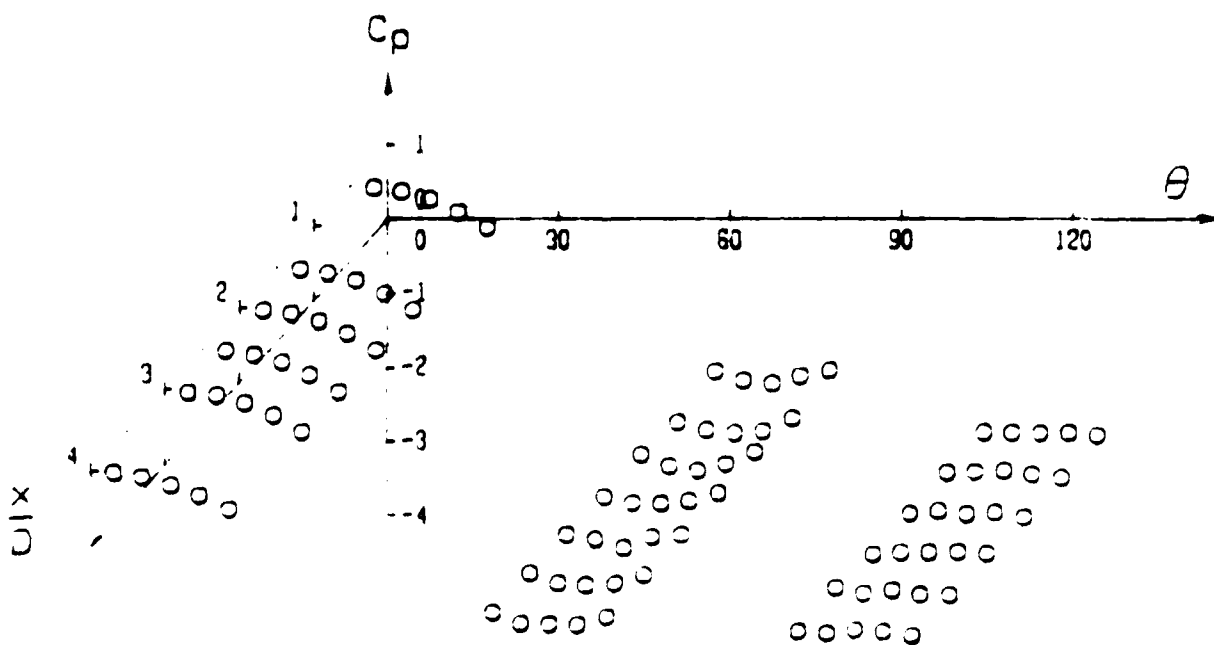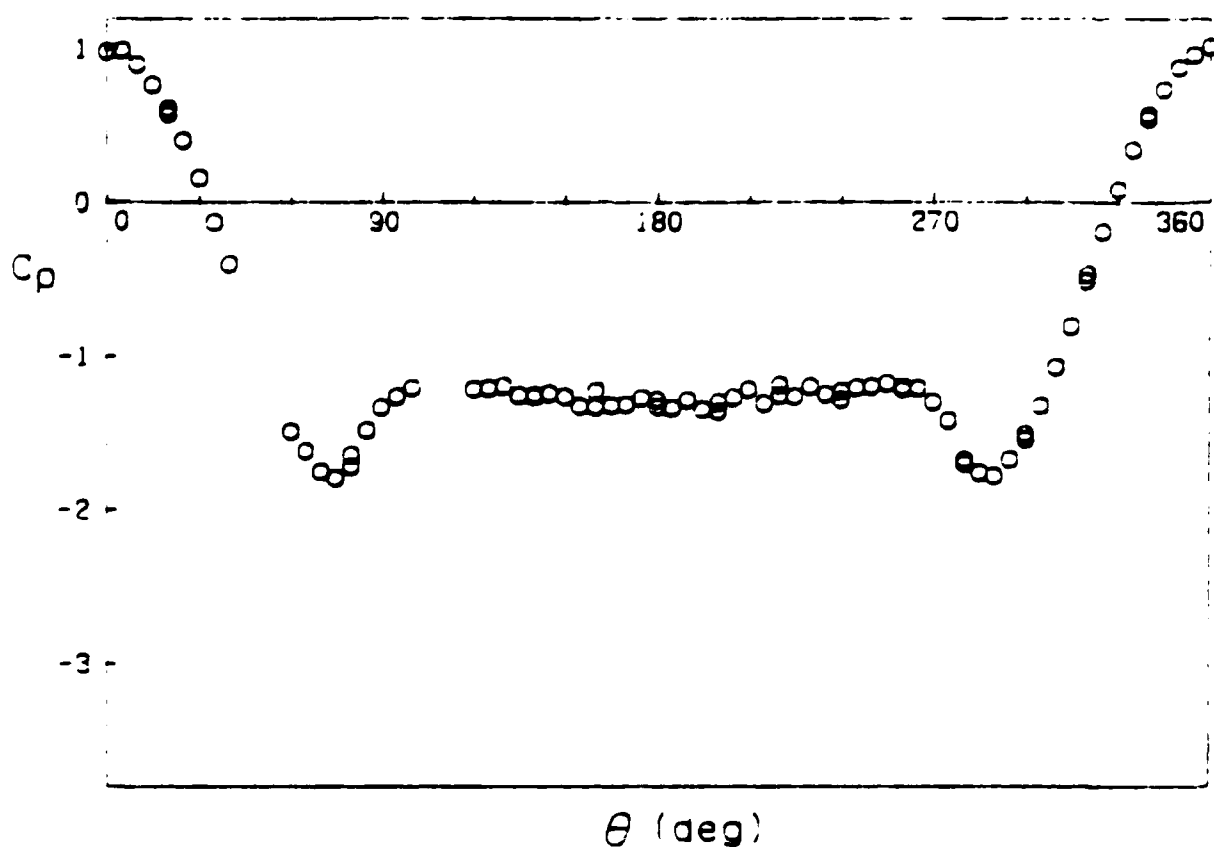
[ROUGH CYLINDER]

Re= 0.822 x10⁶   K/D= 0.0100   RUN ID= 146

θ (deg)
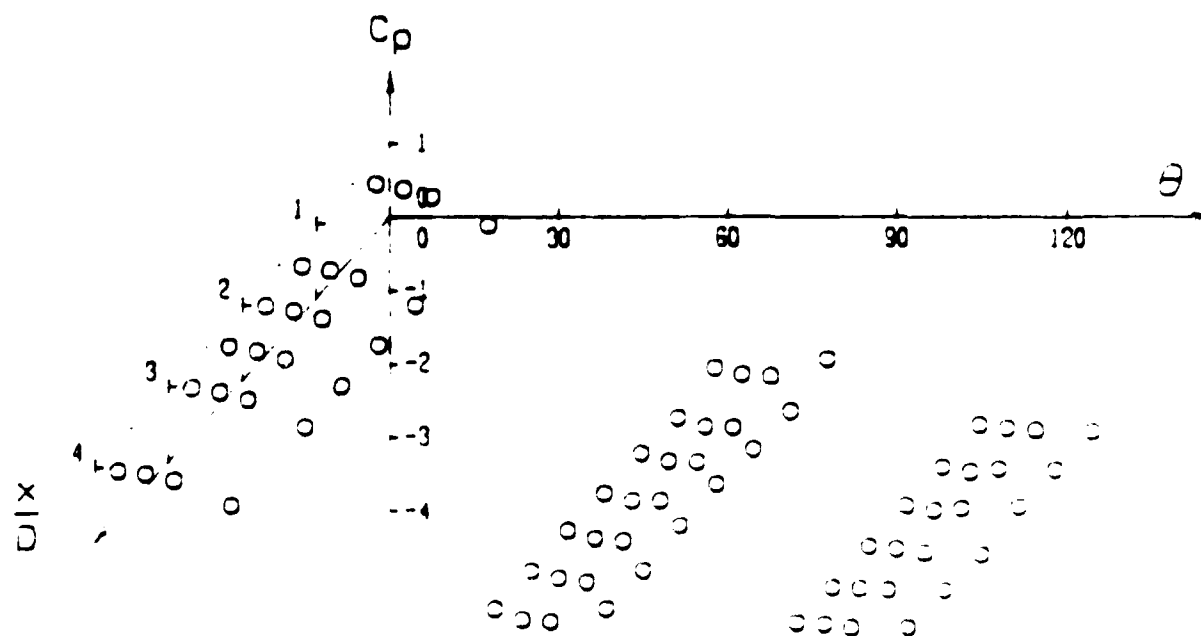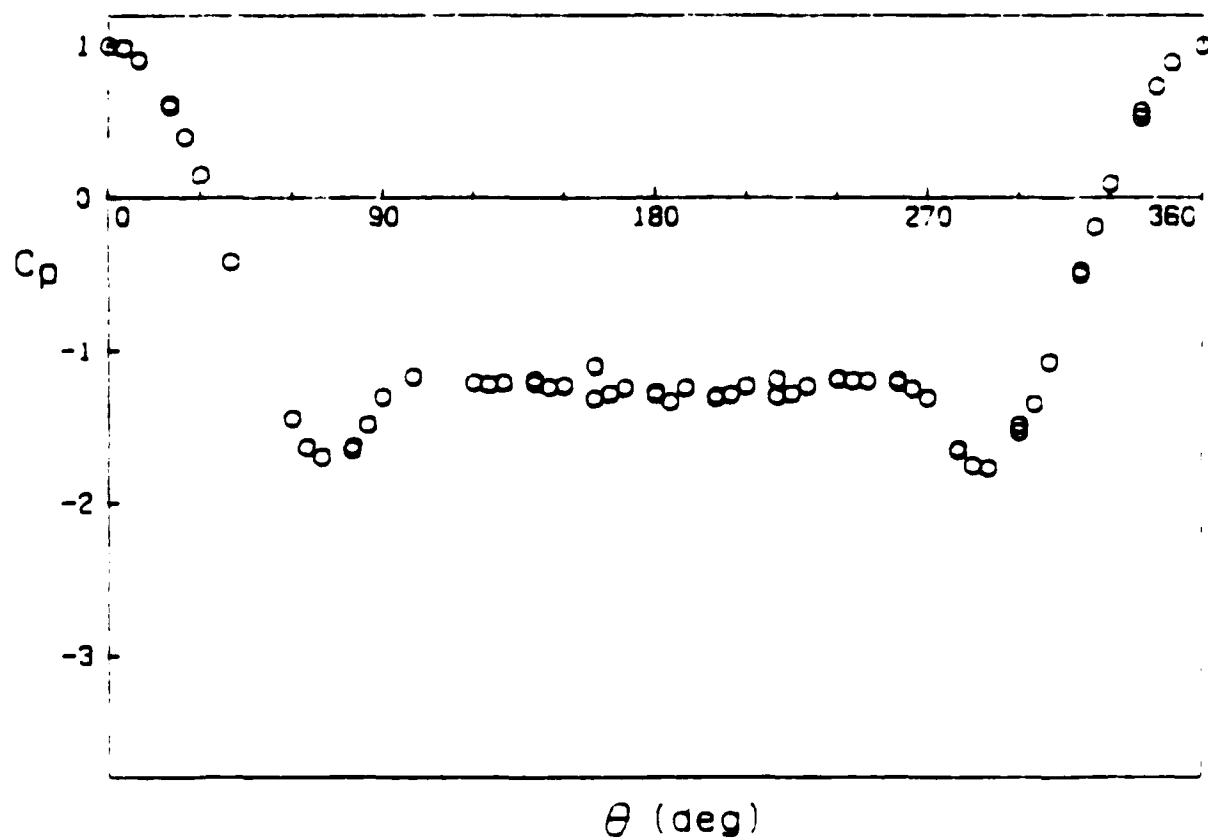
[ROUGH CYLINDER]

Re= 0.947 x10⁶   k/D= 0.0100   RUN ID= ...

C_p

θ (deg)
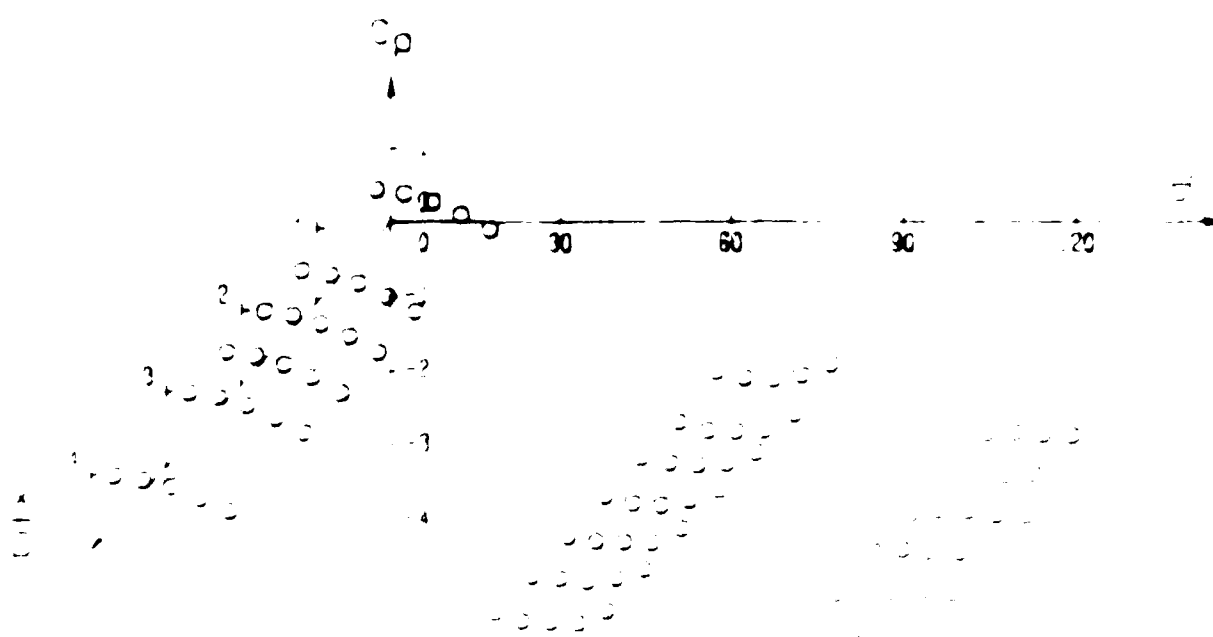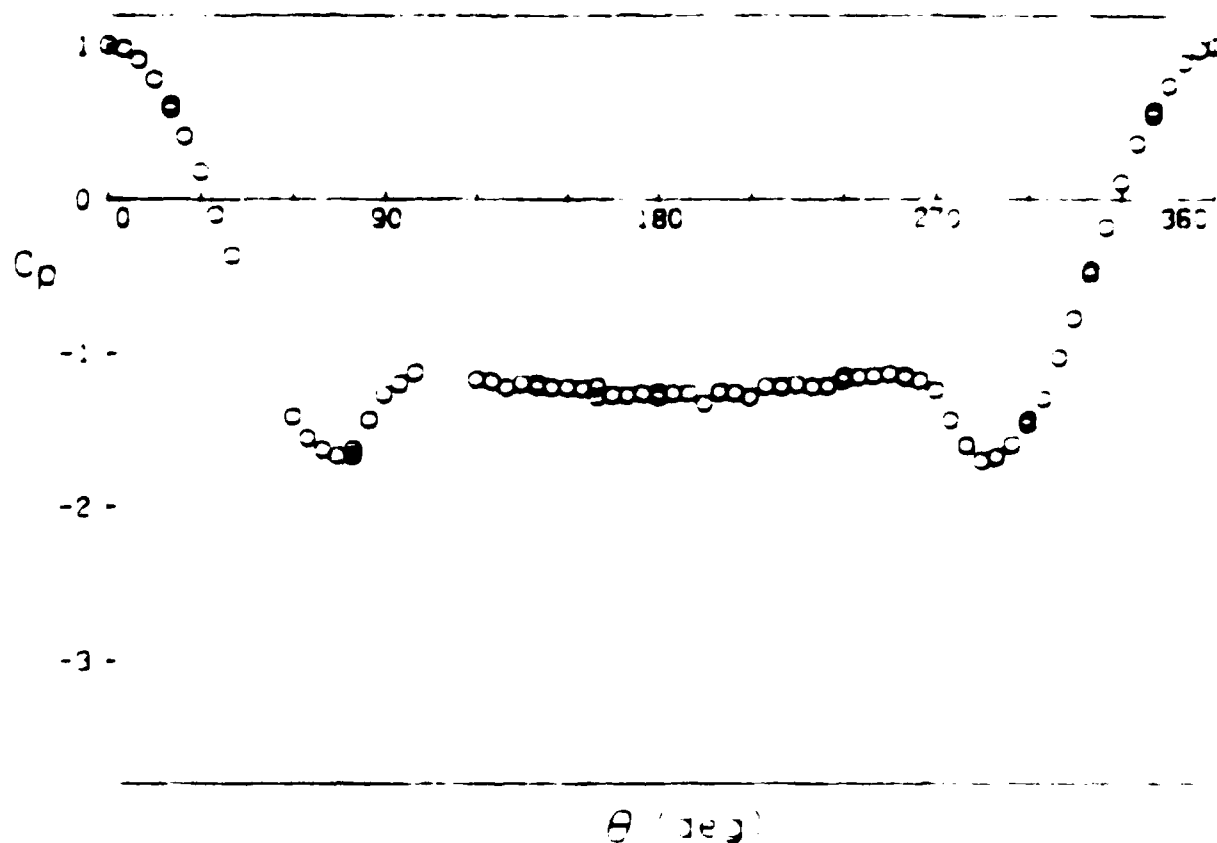
ROUGH CYLINDER

Re= 1.057 x10⁶   K/D= 0.0100   RUN ID= 148
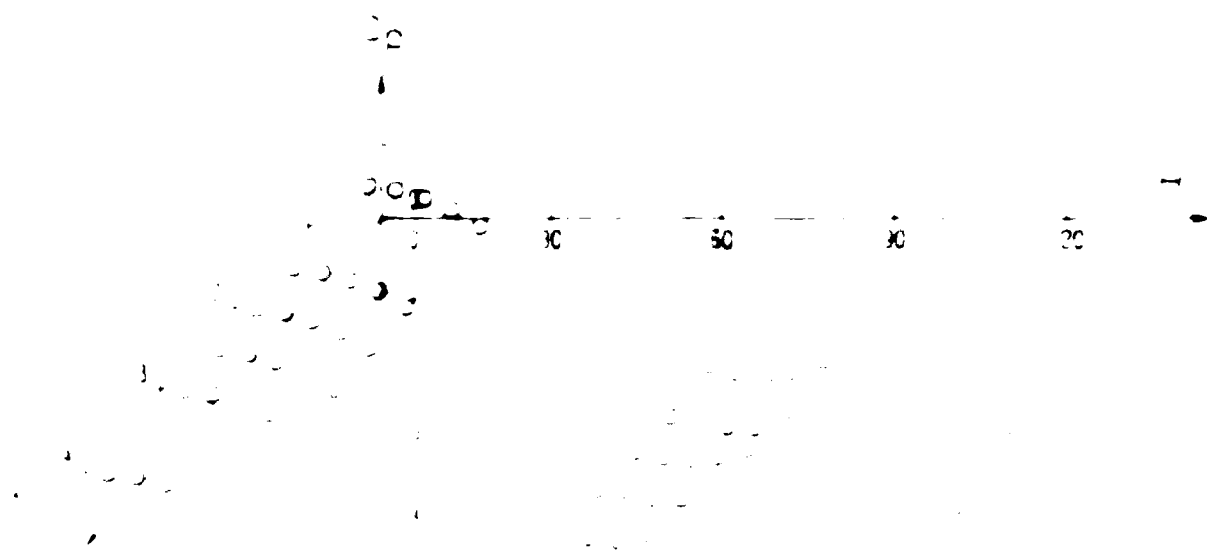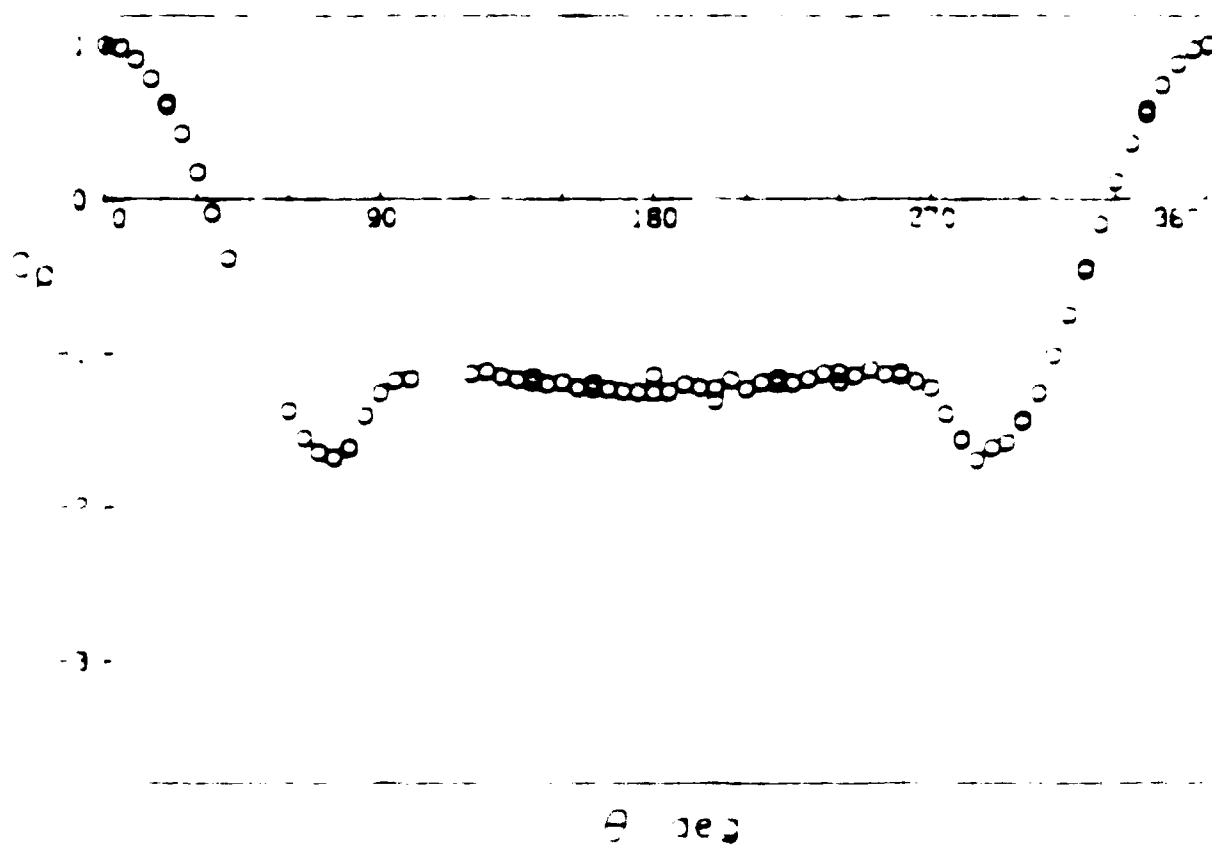
[ROUGH CYLINDER]

Re= 1.29⁷ x10⁶   K/D= 0.0100   RUN ID= 140
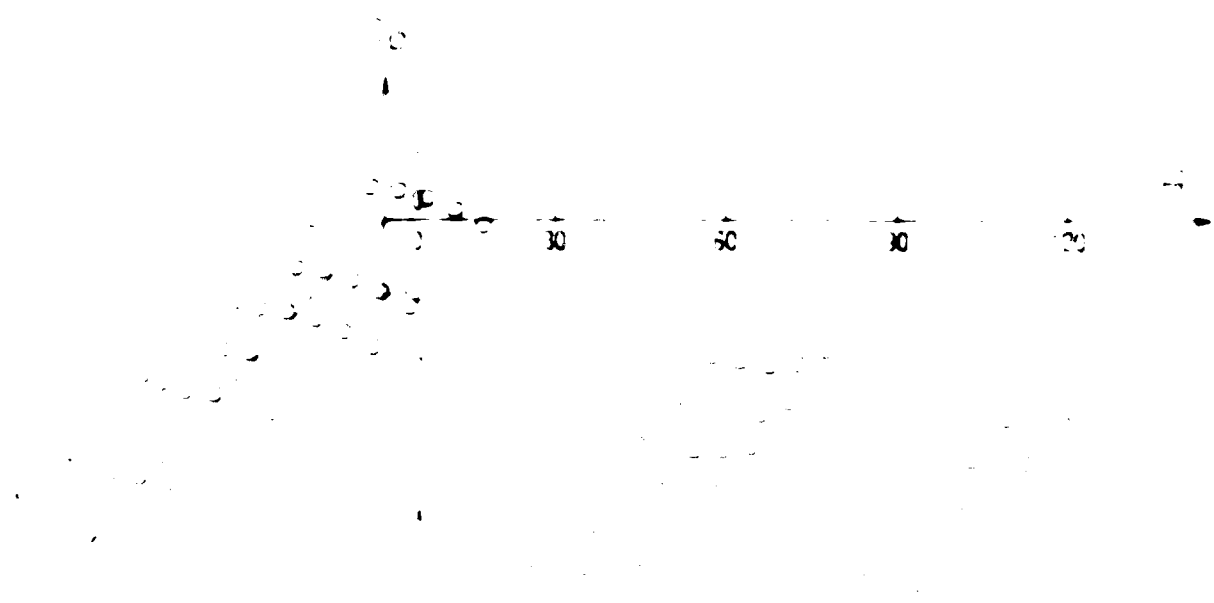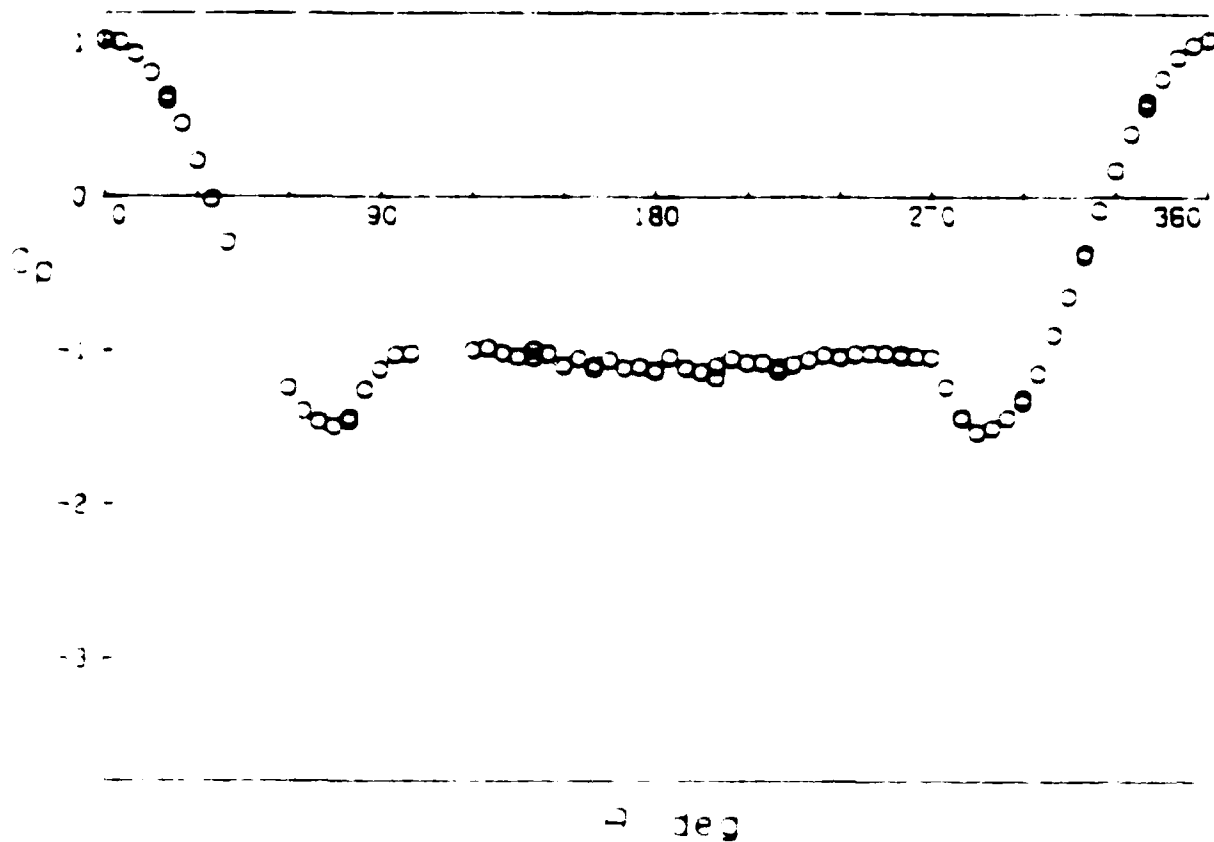
[ROUGH CYLINDER]

Re= 1.537 x10⁶   K/D= 0.0100   RUN ID= 139
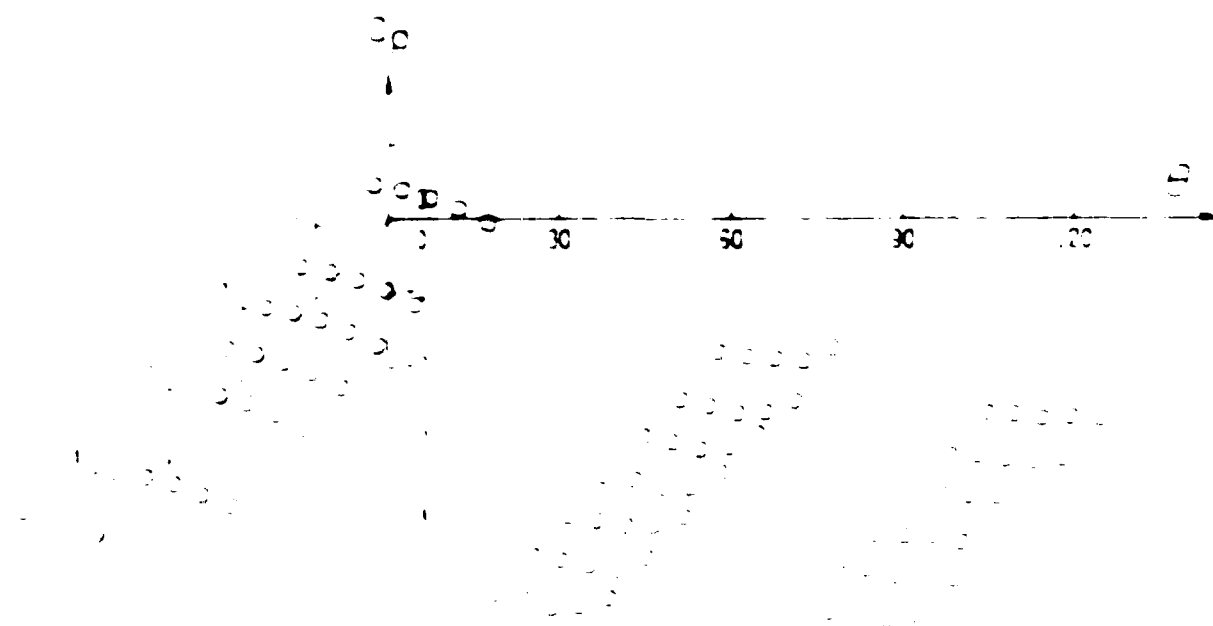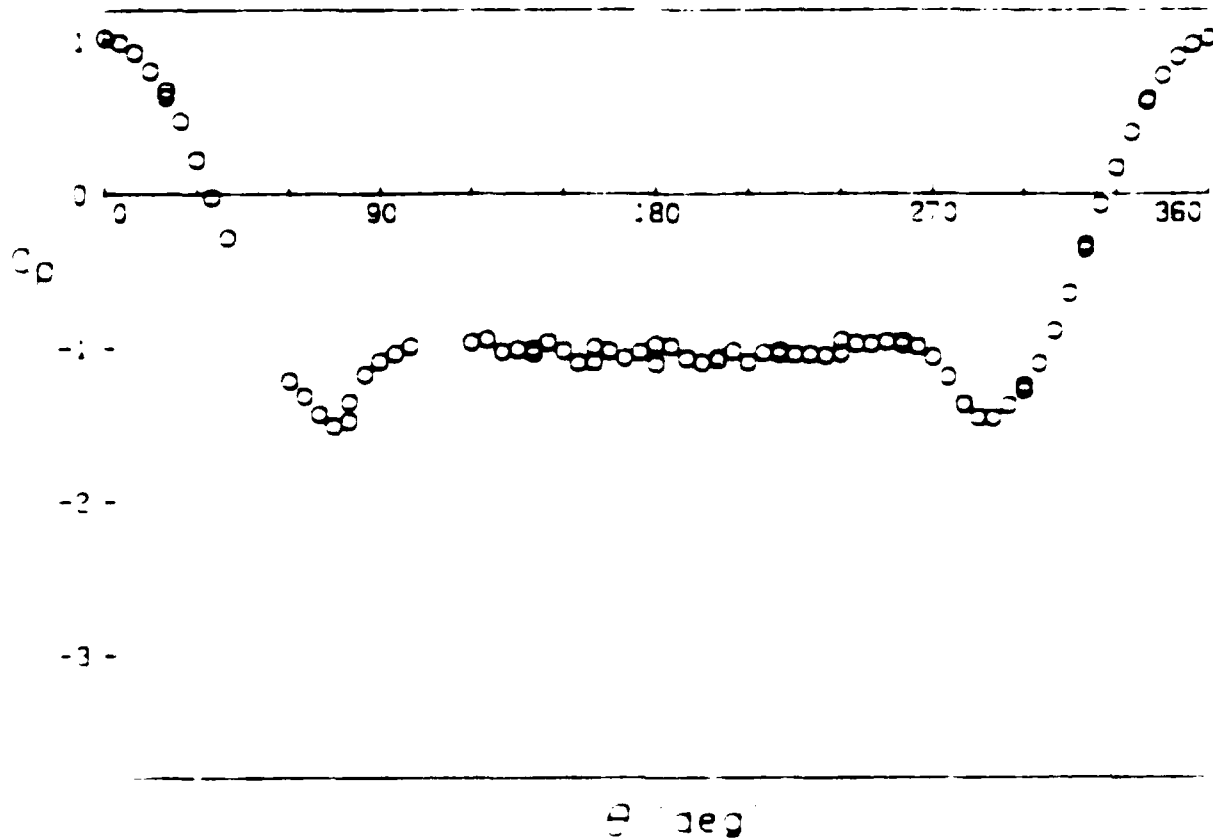
ROUGH CYLINDER

Re= 2.064 x10⁶   K/D= 0.0100   RUN ID= 137
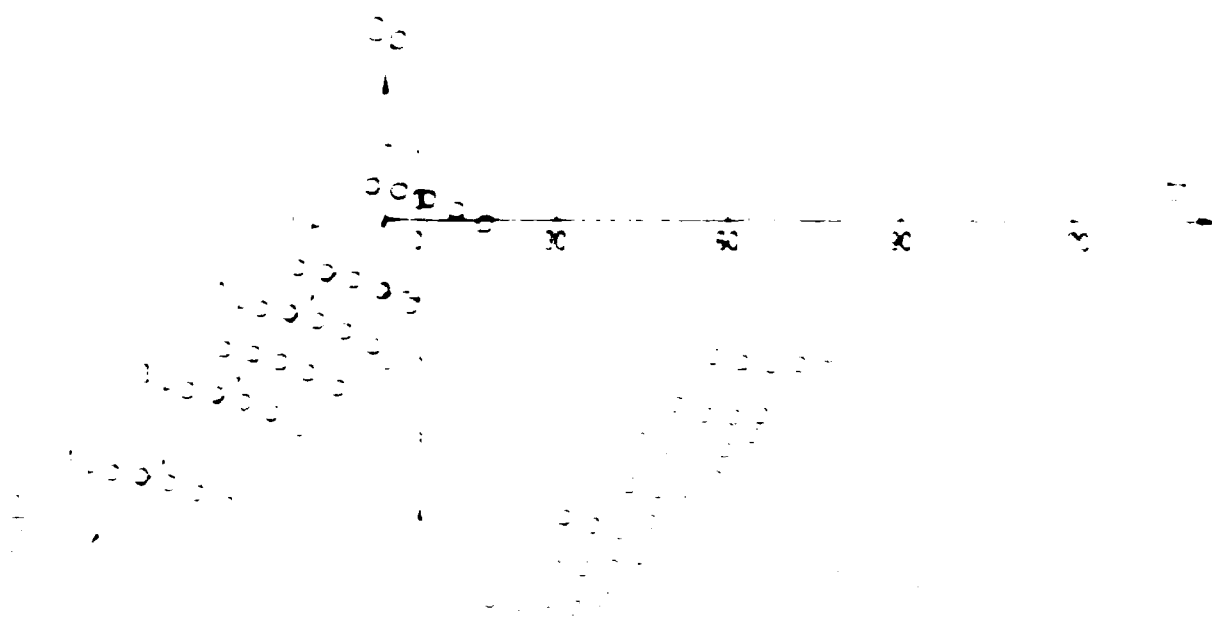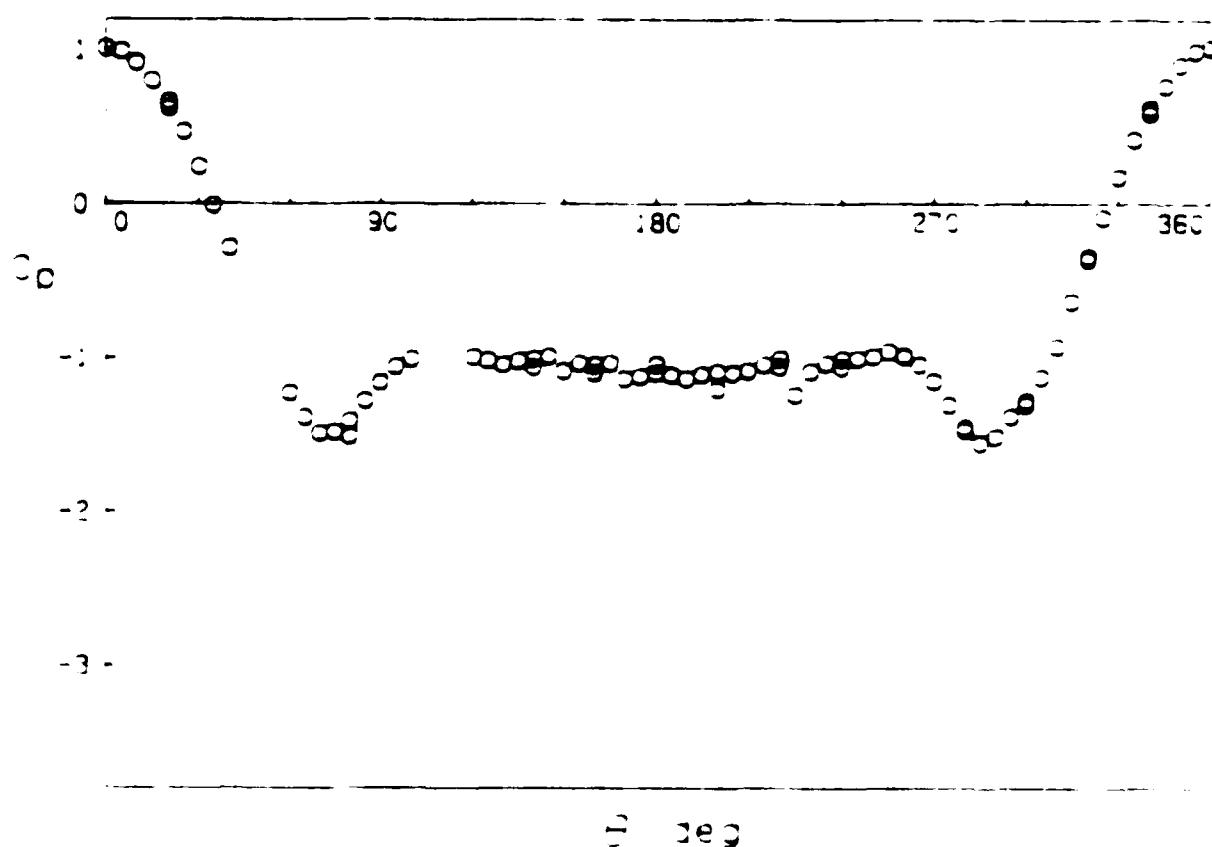
[ROUGH CYLINDER]

Re= 2.127 x10⁶   k/D= 0.0100   RUN ID= 152
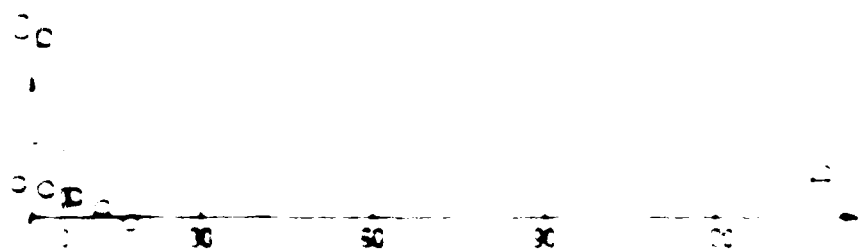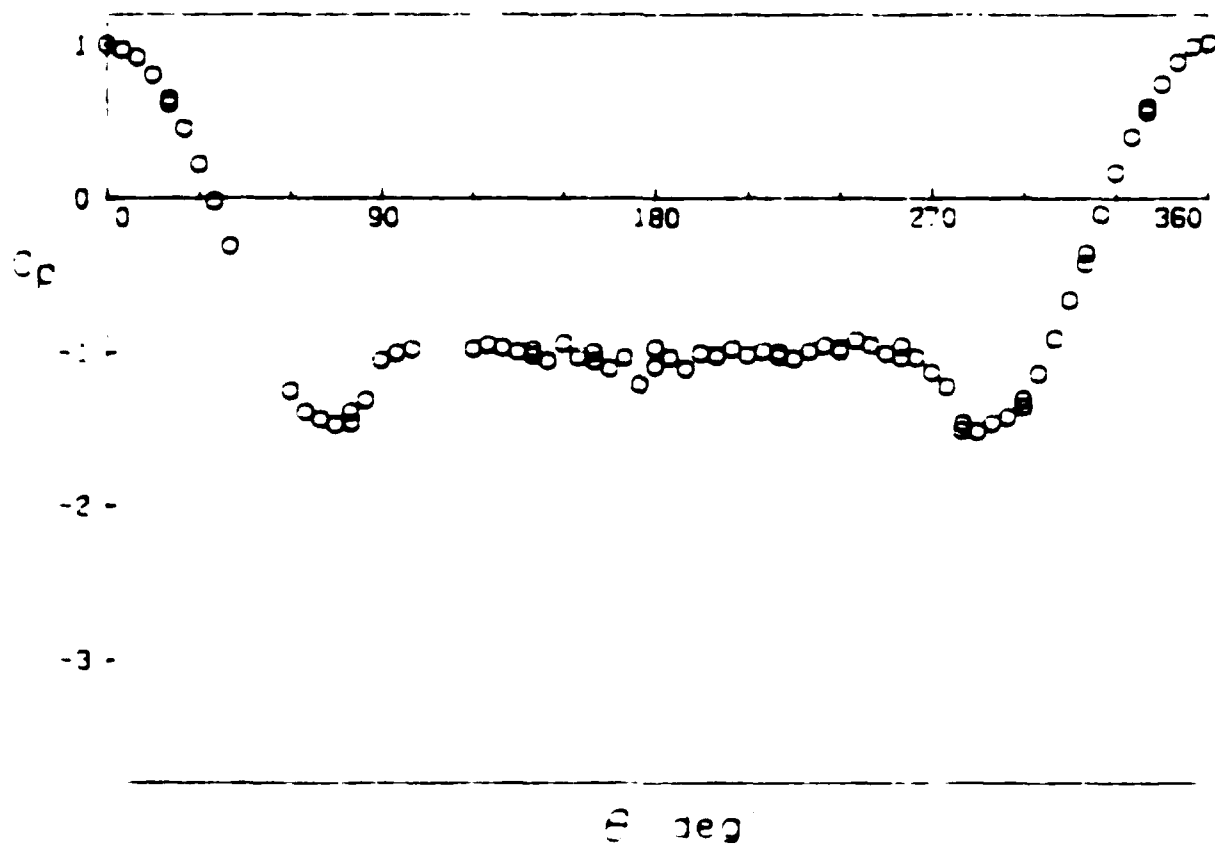
[ROUGH CYLINDER]

Re= 2.537 x10⁶   K/D= 0.0100   RUN ID= 136
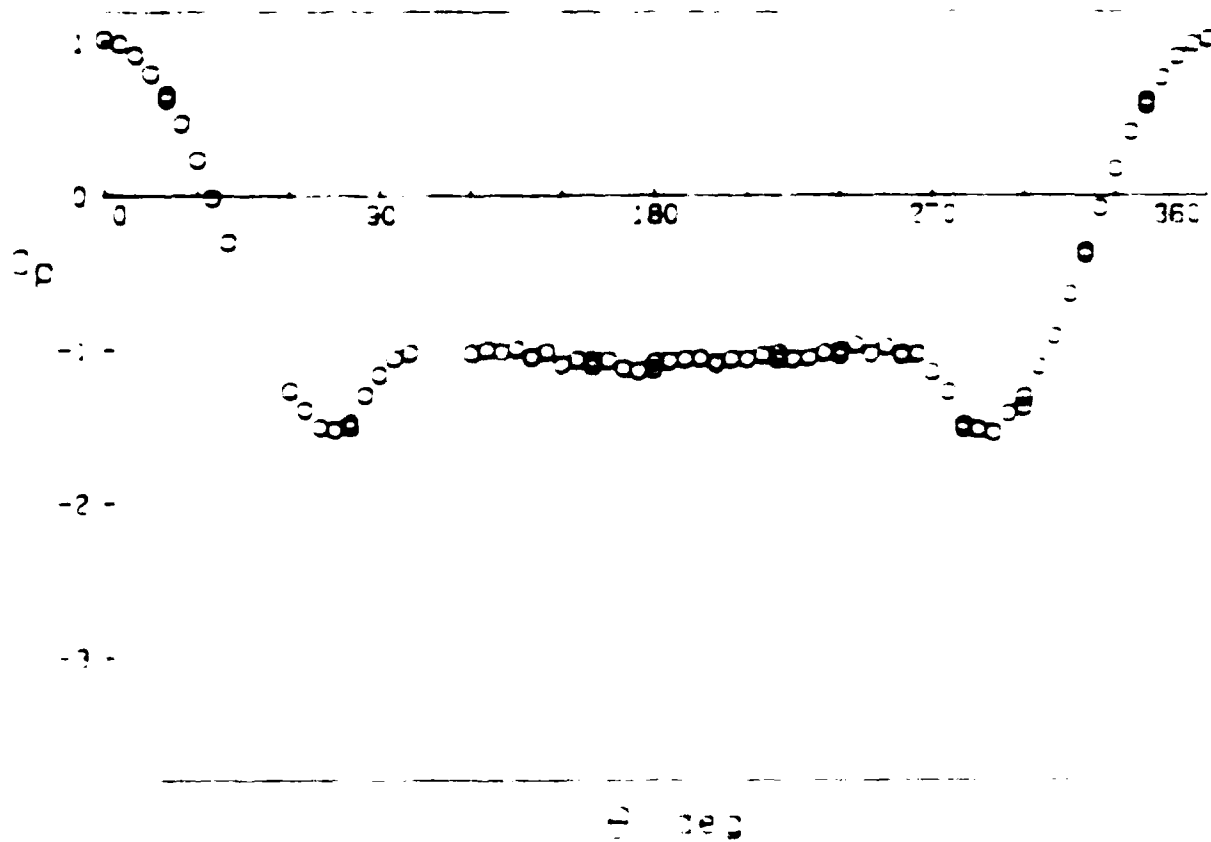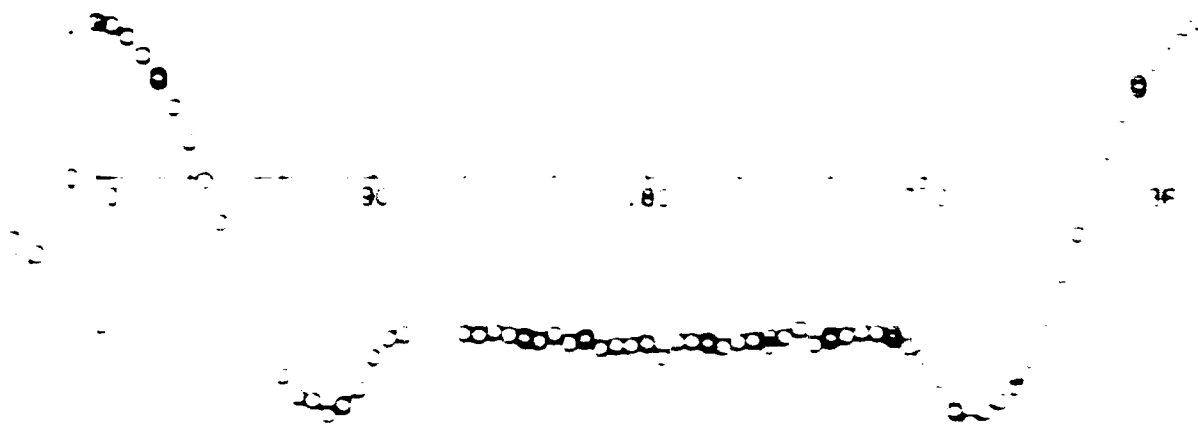
[ROUGH CYLINDER]

Re= 3.515 x10^6 K/D= 0.0100   RUN ID= 153

θ (deg)
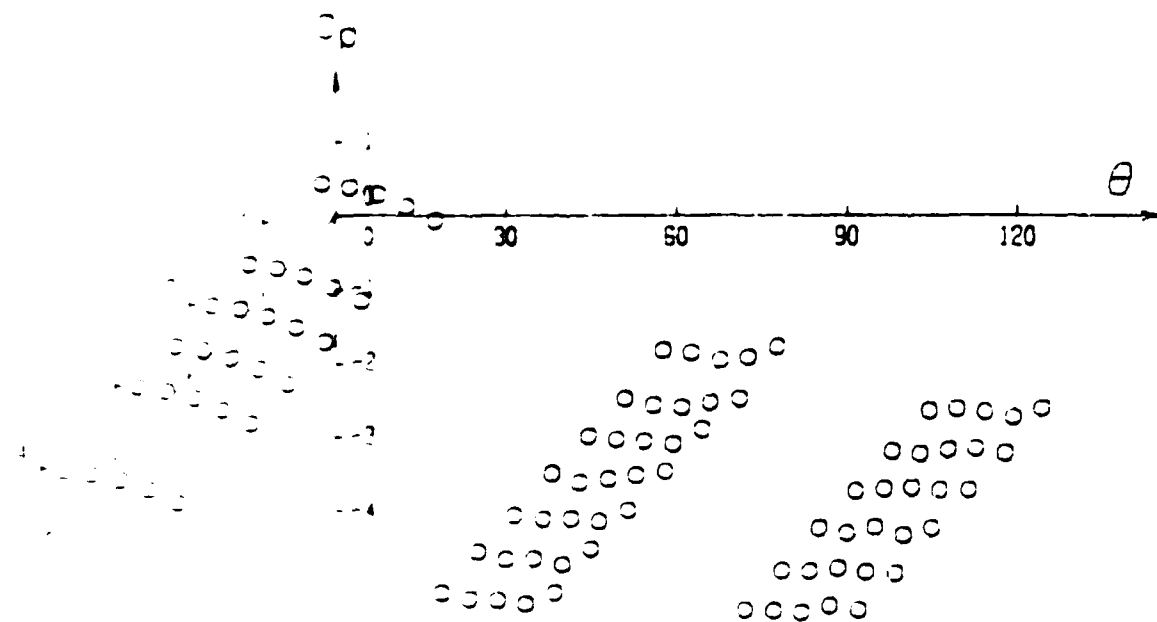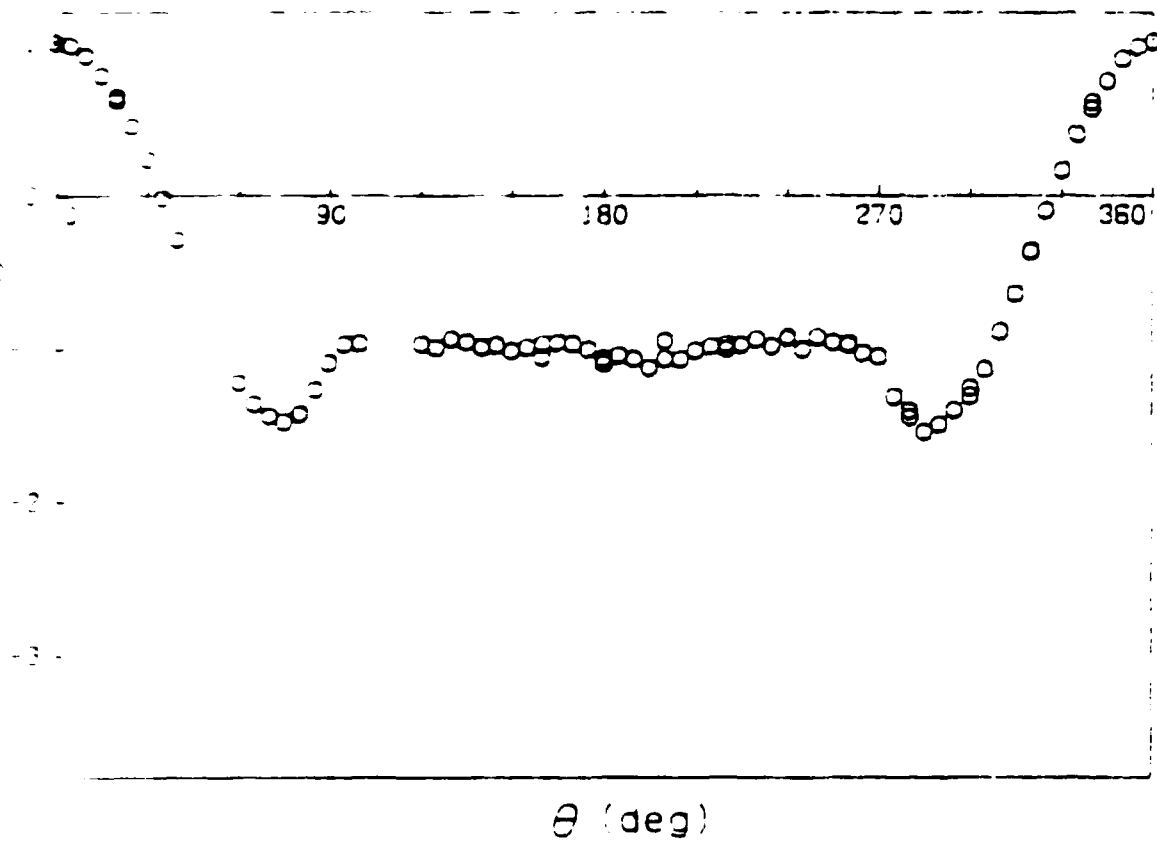
ROUGH CYLINDER

Re= 4.185 ×10⁶   K/D= 0.0100   RUN ID= 134

θ (deg)
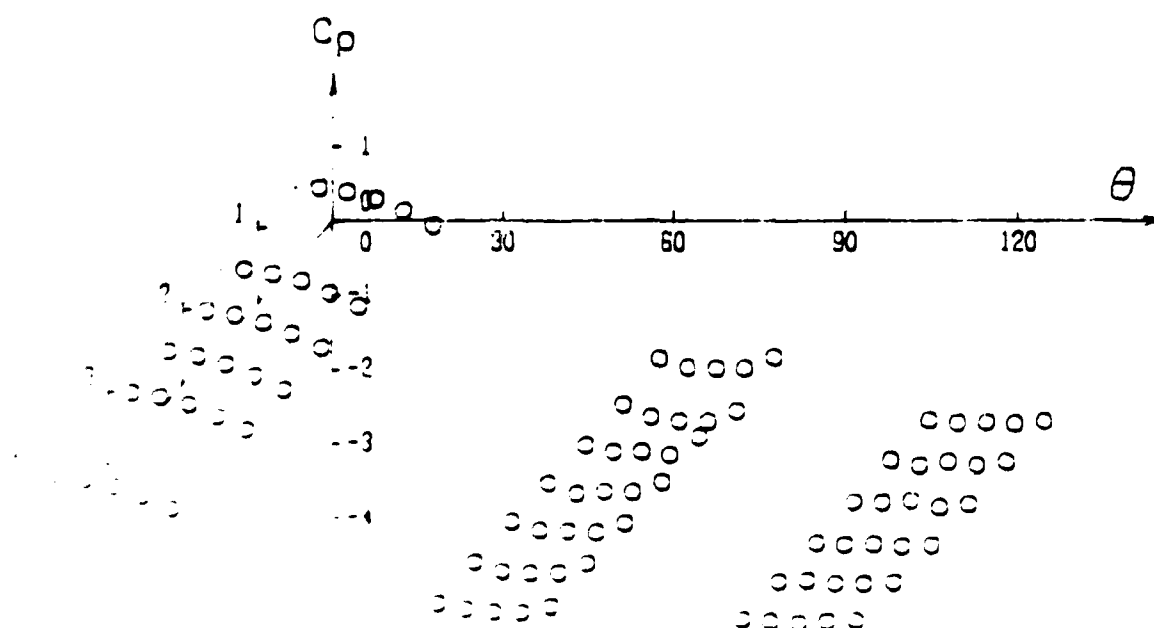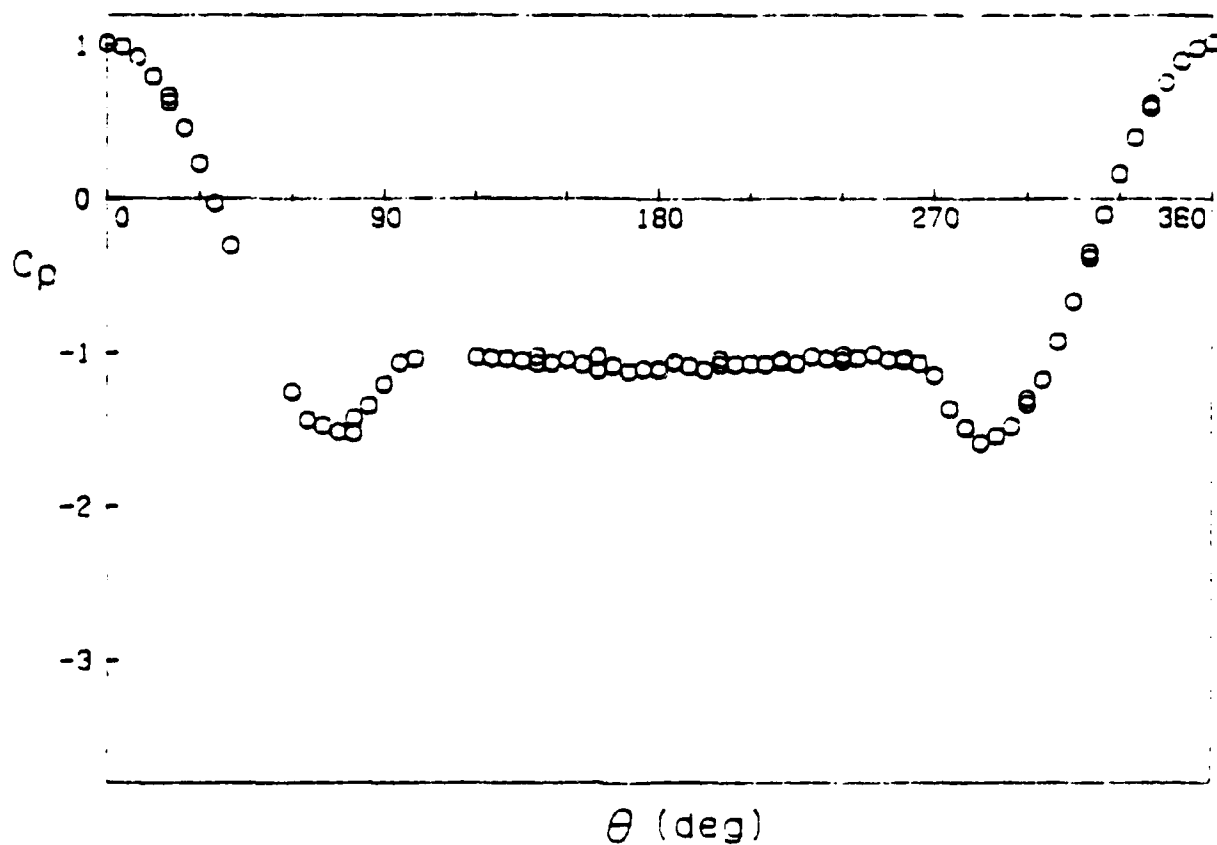
[ROUGH CYLINDER]

Re= 4.209 x10⁶   K/D= 0.0100   RUN ID= 154

C_p

θ (deg)

C_p

θ

$\frac{x}{D}$
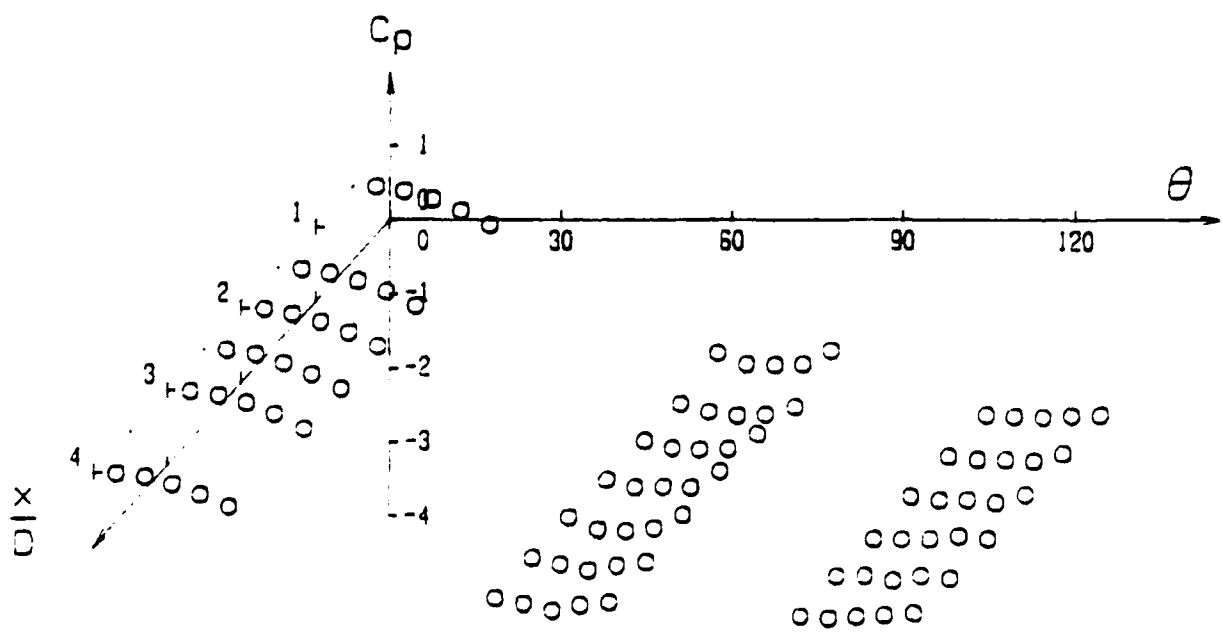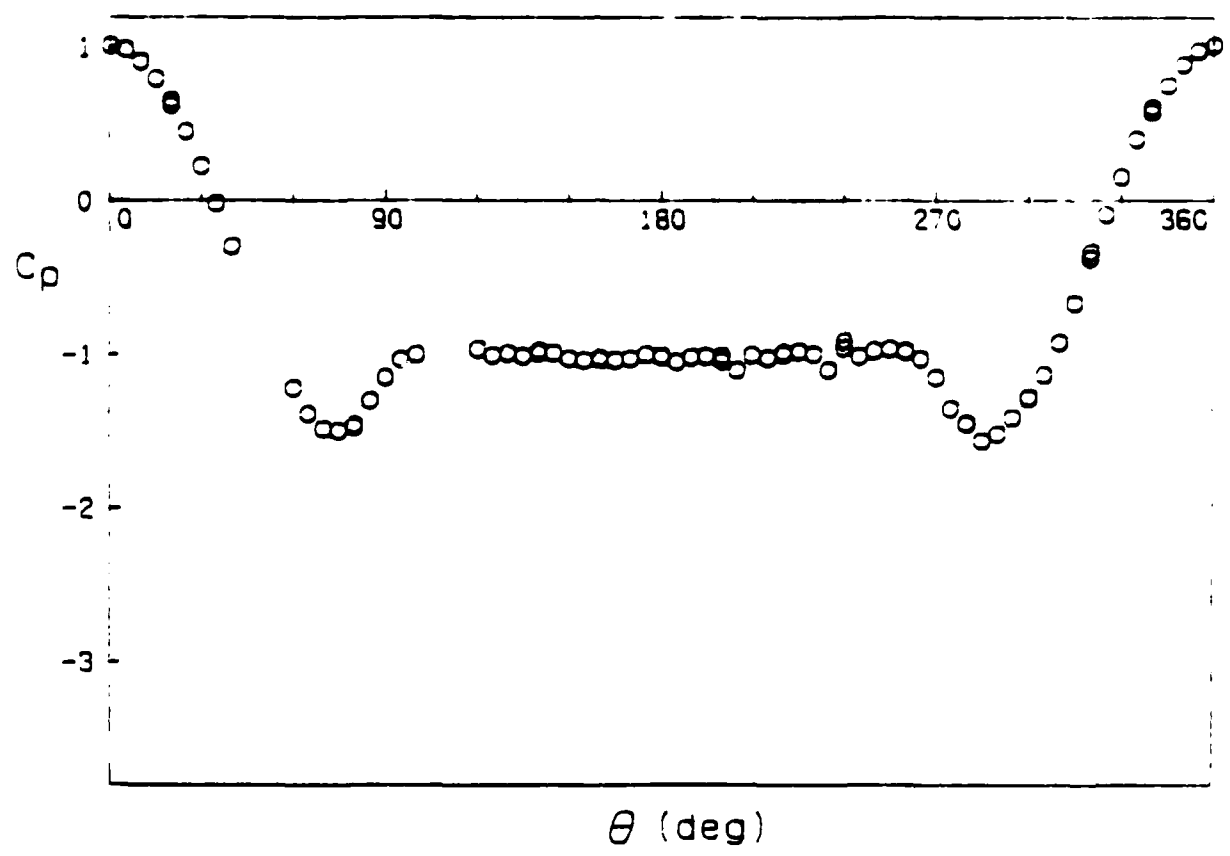
[ROUGH CYLINDER]

Re= 5.105 x10⁶   K/D= 0.0100   RUN ID= 133
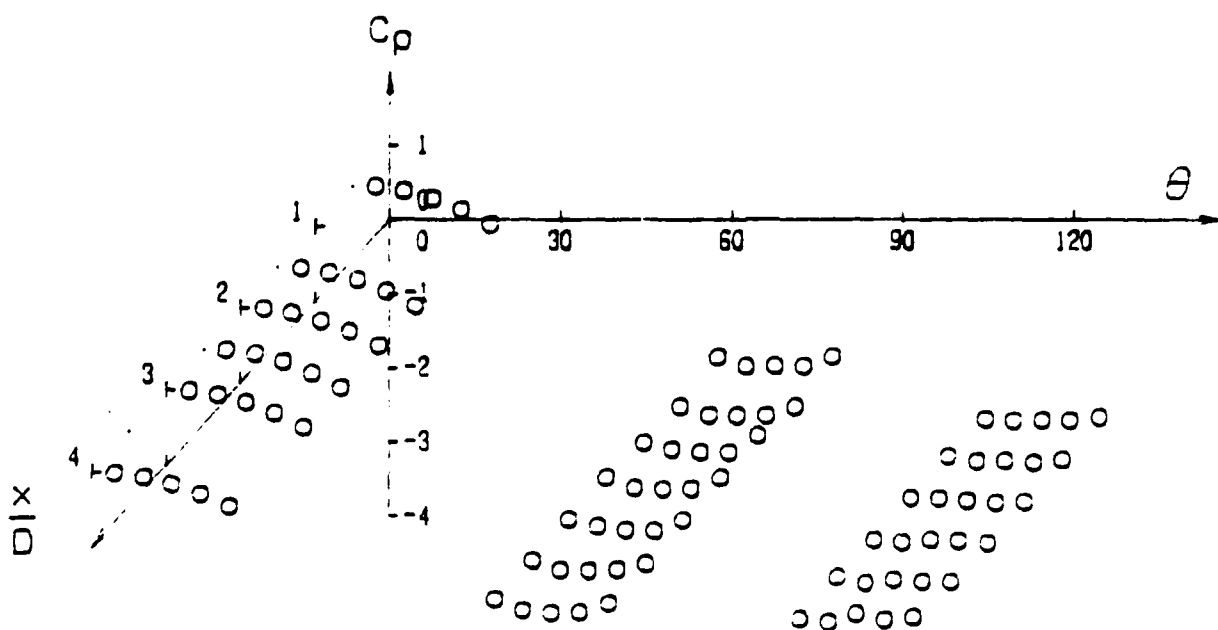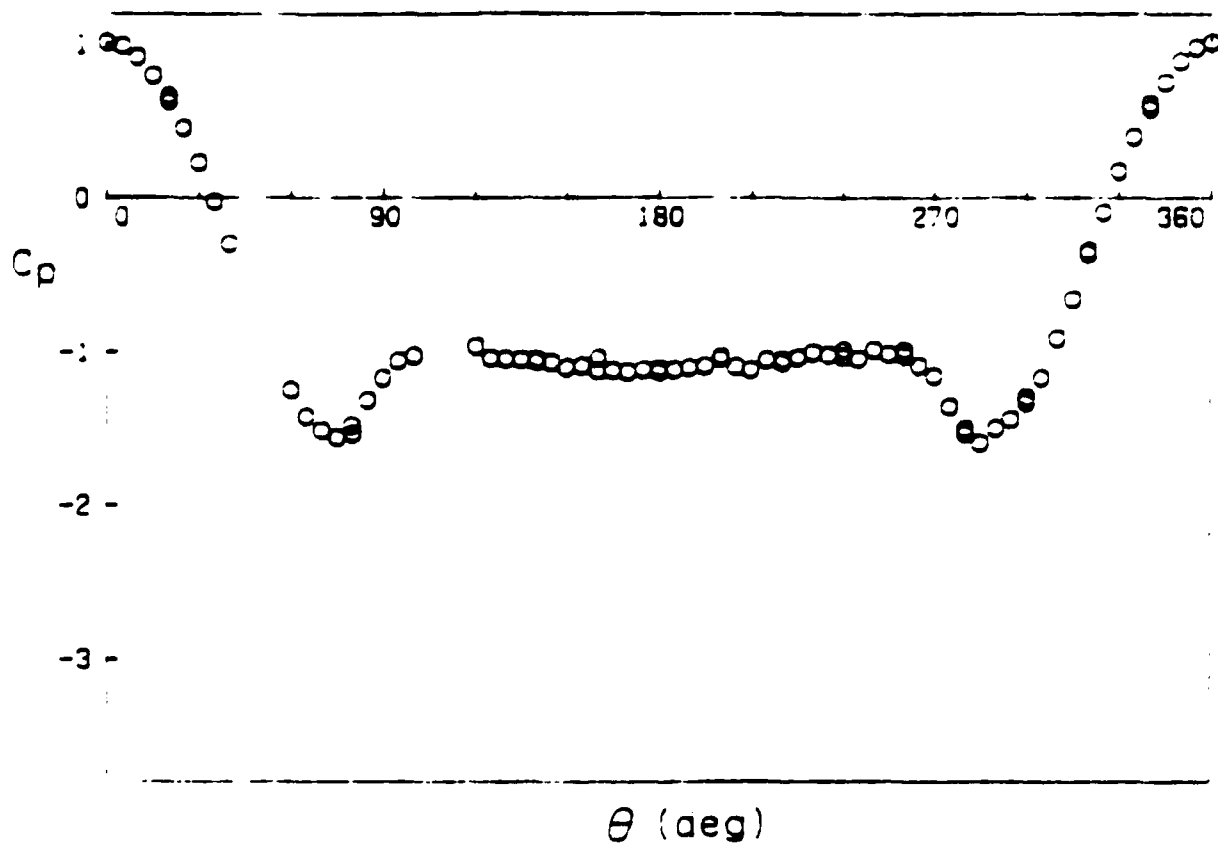
[ROUGH CYLINDER]

Re= 5.218 x10⁶   K/D= C.C:CC   RUN ID= :55
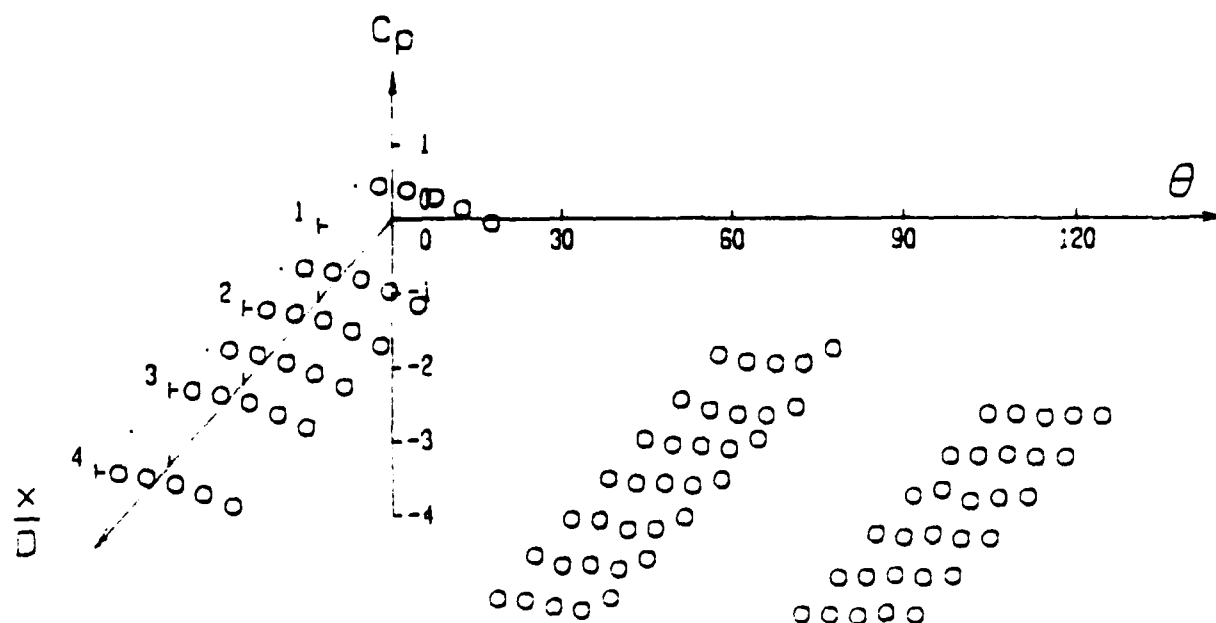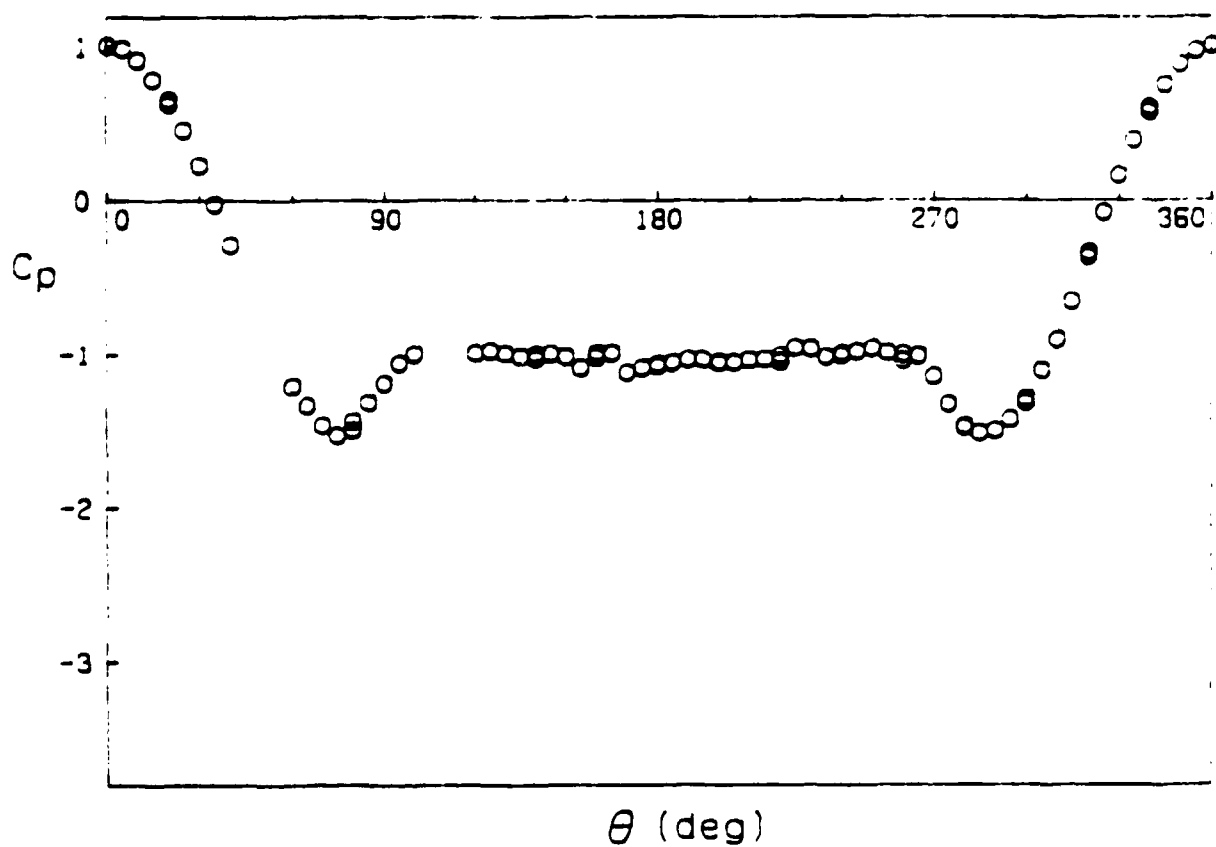
[ROUGH CYLINDER]

Re= 6.136 x10⁶   κ/D= 0.0100   RUN ID= 198

θ (deg)

IV-19
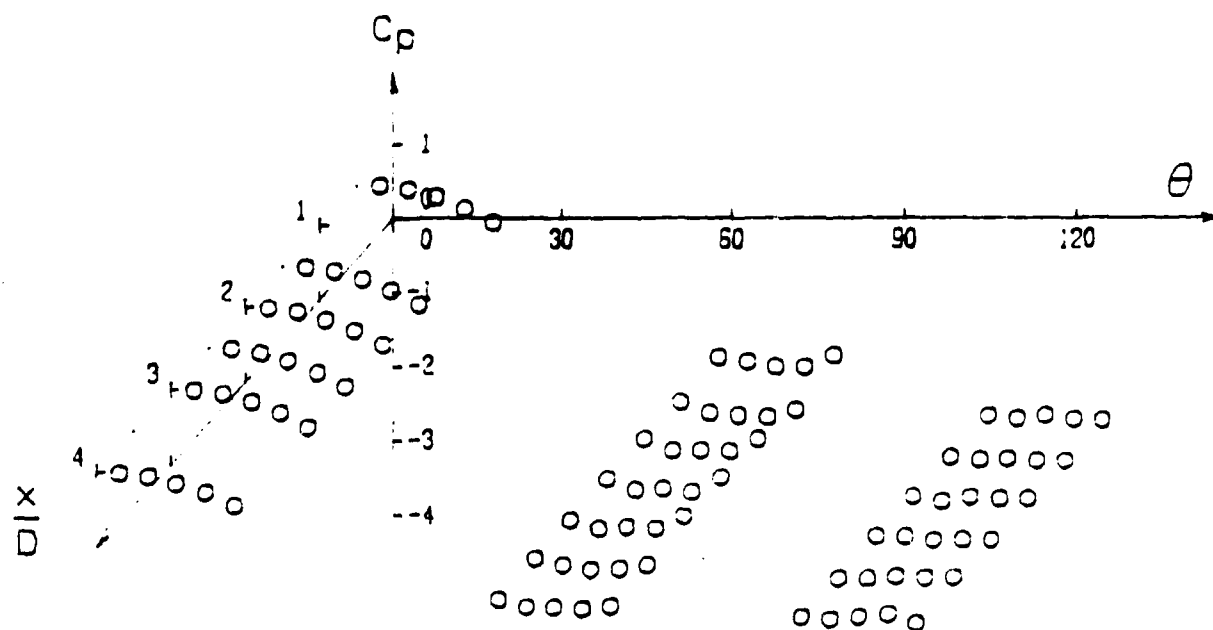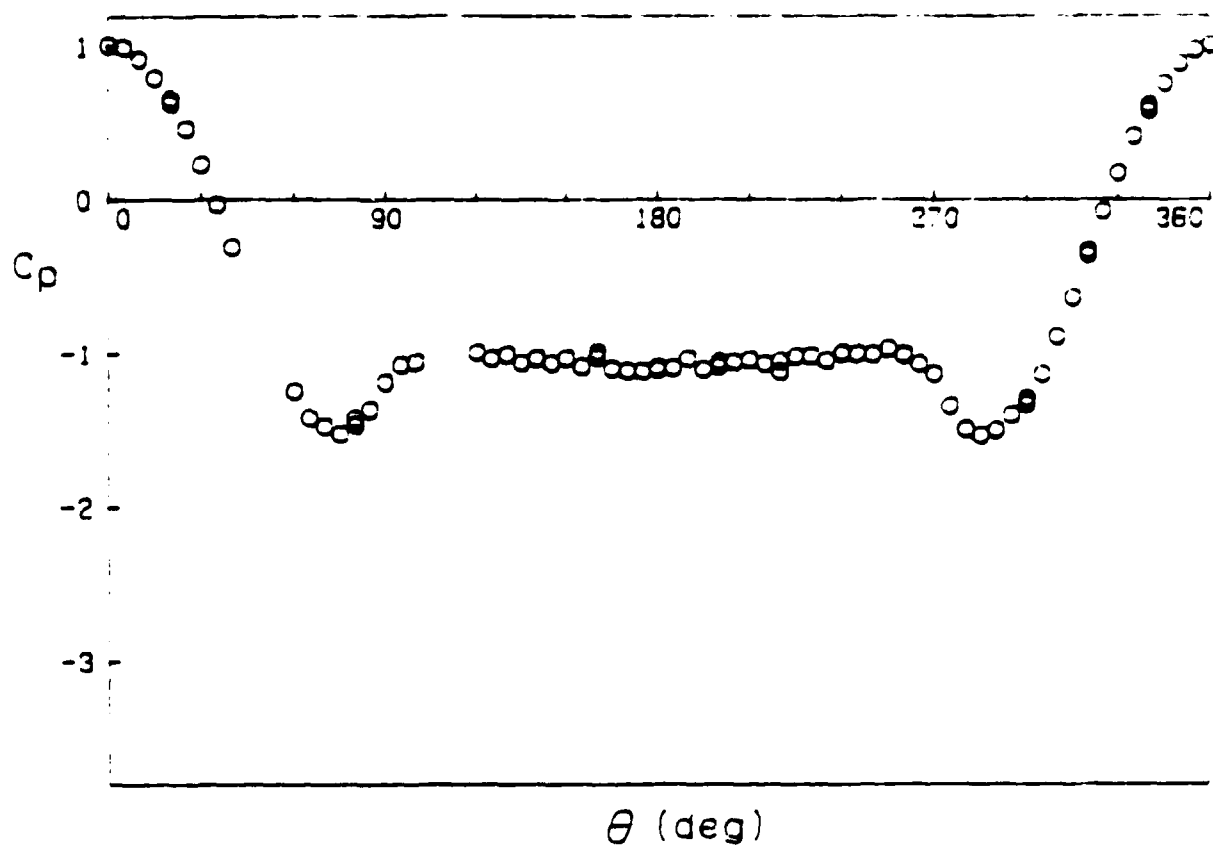
ROUGH CYLINDER

$Re = 6.590 \times 10^6$ $k/D = 0.00$ $R/D = .32$

Cp

θ (deg)

ROUGH CYLINDER

Re = 5.710 x10⁴   k/D = 0.0100   ΔΛ/D = 0.16?
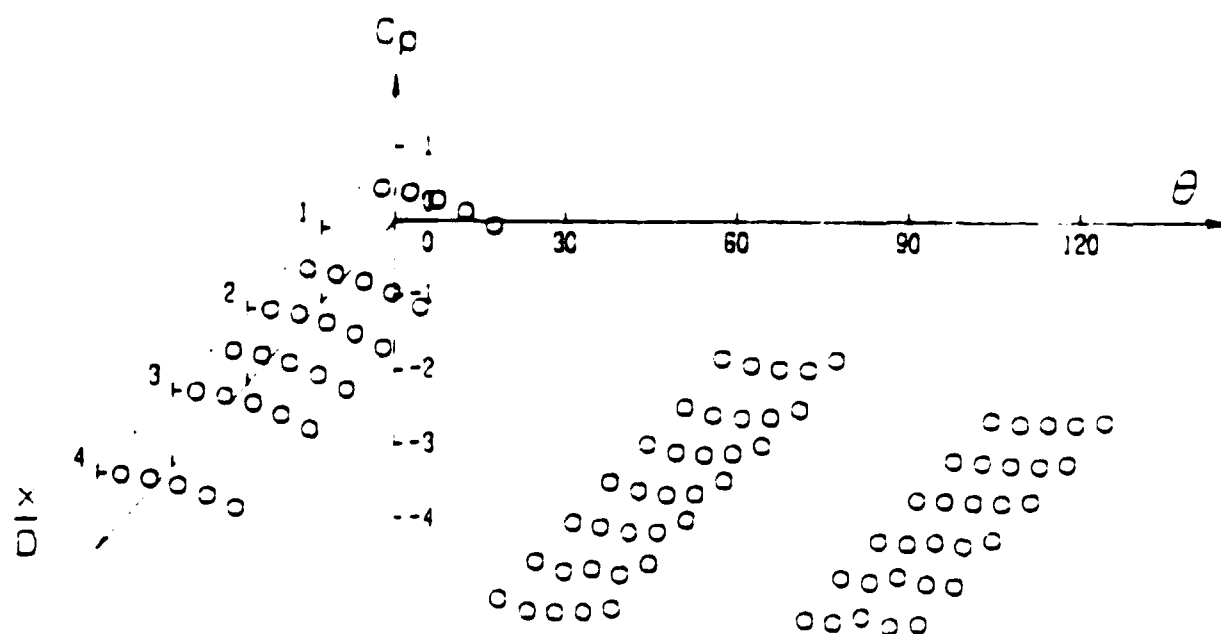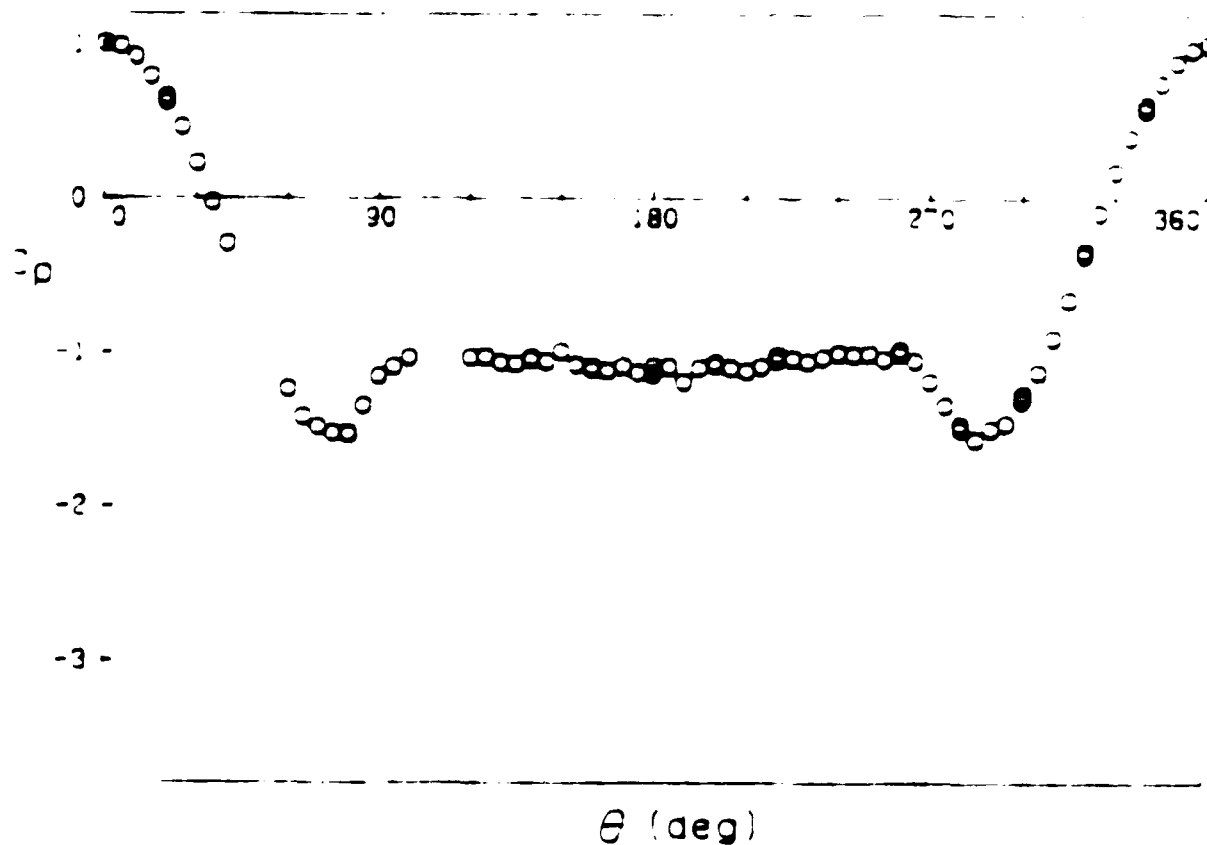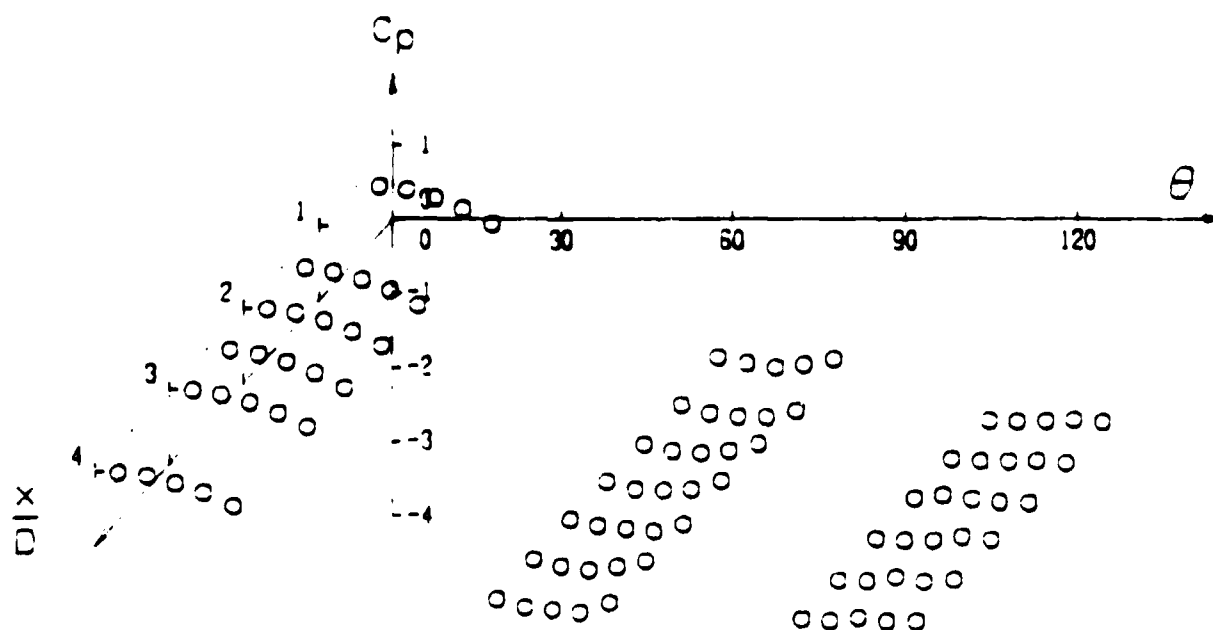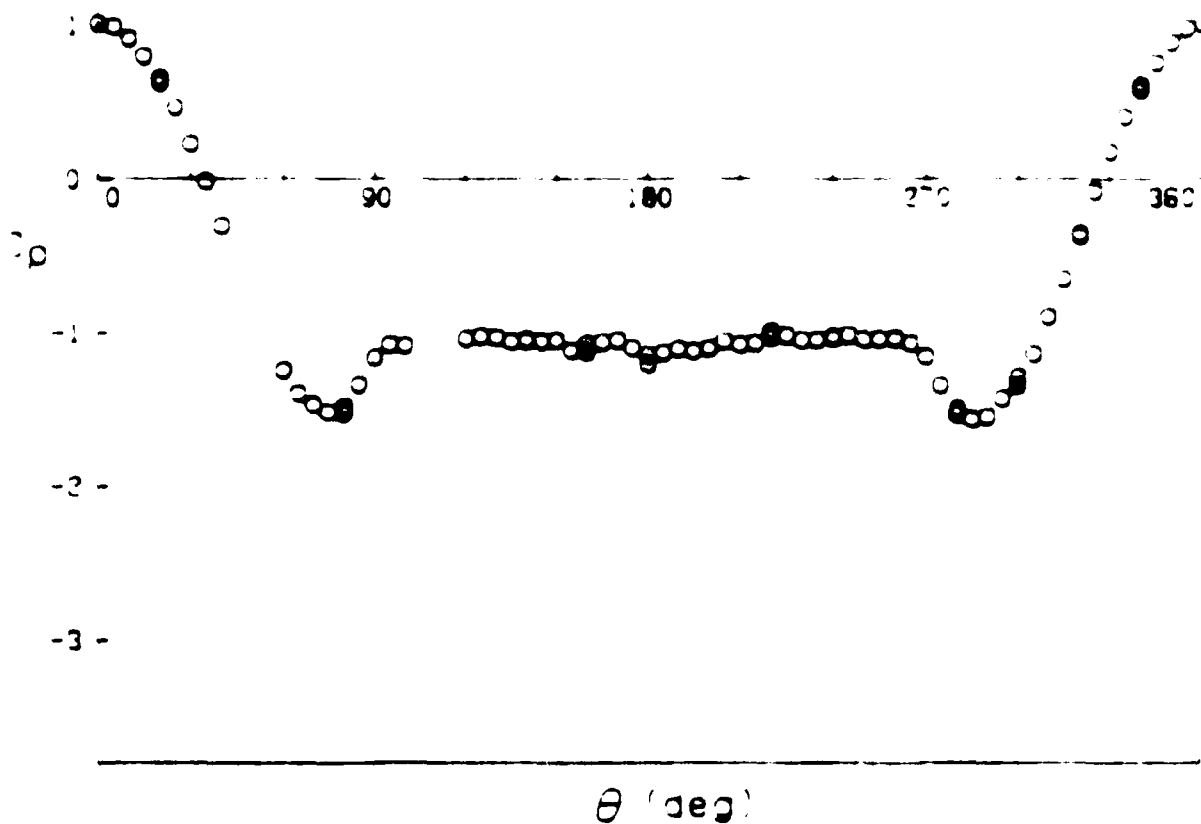
APPENDIX V

TABLES OF PRESSURE DISTRIBUTION

SMOOTH CYLINDER

REY NO. = 7.780 E+6	K/D = 0.0000	MACH NO. = 0.236
CD = 0.465	CL = 0.036	RUN ID = 5

THETA	CP	THETA	CP	THETA	CP
0.05	1.0141	120.05	-0.5911	240.05	-0.5435
5.05	1.0001	125.05	-0.6016	245.05	-0.5356
10.04	0.9312	130.04	-0.5996	250.04	-0.5476
14.93	0.7976	134.93	-0.6660	254.93	-0.7900
19.94		139.94		259.94	
20.05	0.6531	140.05	-0.6118	260.05	-1.1053
25.05	0.4348	145.05	-0.6307	265.05	-1.4125
30.04	0.1826	150.04	-0.6763	270.04	-1.5627
34.93	0.1254	154.93	-0.6450	274.93	-1.9188
39.94		159.94		279.94	
40.05	-0.4913	160.05	-0.6445	280.05	-2.0918
45.05	-0.8117	165.05	-0.6270	285.05	-2.0902
50.04	-1.1204	170.04	-0.6169	290.04	-1.9871
54.93	-1.4598	174.93	-0.5938	294.93	-1.8627
59.94		179.94		299.94	
60.05	-1.5037	180.05	-0.5602	300.05	-1.7192
65.05	-1.7543	185.05	-0.5759	305.05	-1.4700
70.04	-1.7775	190.04	-0.5694	310.04	-1.1204
74.93	-1.9057	194.93	-0.5644	314.93	-0.8053
79.94		199.94		319.94	
80.05	-2.0767	200.05	-0.5574	320.05	-0.5660
85.05	-2.0047	205.05	-0.5833	325.05	-0.2644
90.04	-1.7272	210.04	-0.5639	330.04	0.0563
94.93	-1.5023	214.93	-0.5870	334.93	0.3402
99.94		219.94		339.94	
100.05		220.05	-0.5742	340.05	0.5394
105.05		225.05	-0.5918	345.05	0.7325
110.04		230.04	-0.5493	350.04	0.8888
114.93		234.93	-0.5802	354.93	0.9806
119.94		239.94		359.94	

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.05	5: 1	1.0085		1.0085	1.0096	1.0085	1.0085		1.0052
9.05	5: 2	0.9530		0.9553	0.9553	0.9518	0.9524		0.9565
14.04	5: 3	0.8366		0.8372	0.8394	0.8349	0.8394		0.8620
18.93	5: 4	0.6638		0.6581	0.6581	0.6575	0.6660		0.7179
23.94	5: 5								
64.05	5: 1	-1.3691	-1.6715	-1.6524	-1.6637	-1.5593	-1.6822	-1.6089	
69.05	5: 2	-1.5585	-1.9456	-1.9057	-1.8012	-1.7852	-1.8851	-1.8200	
74.04	5: 3	-1.7292	-2.0687	-2.0339	-1.9282	-1.9529	-2.0687	-1.9607	
78.93	5: 4	-1.8506	-2.2626	-2.1559	-2.0907	-2.2507	-2.1763	-2.0083	
83.94	5: 5								
124.05	5: 1	-0.7207		-0.7218	-0.7057	-0.5924	-0.7385	-0.7990	-0.6149
129.05	5: 2	-0.7009		-0.7756	-0.7195	-0.6313	-0.7184	-0.6434	-0.6173
134.04	5: 3	-0.6702		-0.6540	-0.6373	-0.6713	-0.6757	-0.6979	-0.6365
138.93	5: 4	-0.7215		-0.6484	-0.6518	-0.6793	-0.7327	-0.6851	-0.6445
143.94	5: 5								

SMOOTH   CYLINDER

REY NO. = 6.798 E+6   K/D = 0.0000   MACH NO. = 0.236
      CD = 0.453   CL = 0.036   RUN ID =   6

THETA	CP	THETA	CP	THETA	CP
0.03	1.0184	120.03	-0.6176	240.03	-0.6016
4.96	0.9982	124.96	-0.5696	244.96	-0.5371
10.04	0.9227	130.04	-0.5750	250.04	-0.5532
15.03	0.7963	135.03	-0.5851	255.03	-0.5834
20.01	0.6125	140.01	-0.6677	260.01	-1.1953
20.03	0.6329	140.03	-0.6227	260.03	-1.1351
24.96	0.4210	144.96	-0.6101	264.96	-1.3677
30.04	0.1515	150.04	-0.6363	270.04	-1.6393
35.03	-0.1398	155.03	-0.5957	275.03	-1.8773
40.01	-0.4549	160.01	-0.6305	280.01	-2.1449
40.03	-0.5191	160.03	-0.5883	280.03	-2.1462
44.96	-0.7625	164.96	-0.6091	284.96	-2.0794
50.04	-1.1360	170.04	-0.6077	290.04	-1.9843
55.03	-1.4820	175.03	-0.5803	295.03	-1.8121
60.01	-1.7048	180.01	-0.5225	300.01	-1.6955
60.03	-1.5597	180.03	-0.5628	300.03	-1.6936
64.96	-1.7555	184.96	-0.5793	304.96	-1.4225
70.04	-1.9410	190.04	-0.5779	310.04	-1.1360
75.03	-2.0526	195.03	-0.5993	315.03	-0.8056
80.01	-1.9657	200.01	-0.6080	320.01	-0.5263
80.03	-2.1072	200.03	-0.5418	320.03	-0.5376
84.96	-1.9822	204.96	-0.6053	324.96	-0.2411
90.04	-1.8341	210.04	-0.6058	330.04	0.0786
95.03	-1.5714	215.03	-0.5904	335.03	0.3526
100.01	-1.0440	220.01	-0.6074	340.01	0.5734
100.03		220.03	-0.5272	340.03	0.5661
104.96		224.96	-0.5830	344.96	0.7459
110.04		230.04	-0.5785	350.04	0.9007
115.03		235.03	-0.5422	355.03	0.9899
120.01		240.01	-0.5998	360.01	1.0151

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.03	6: 1	1.0107		1.0095	1.0095	1.0076	1.0101		1.0037
8.96	6: 2	0.9473		0.9492	0.9498	0.9485	0.9492		0.9523
14.04	6: 3	0.8269		0.8243	0.8282	0.8275	0.8332		0.8519
19.03	6: 4	0.6601		0.6588	0.6645	0.6632	0.6683		0.7198
24.01	6: 5	0.4514		0.4533	0.4552	0.4450	0.4578		0.5415
64.03	6: 1	-1.3778	-1.7070	-1.6711	-1.6916	-1.6954	-1.9176	-1.6935	
68.96	6: 2	-1.5832	-1.9490	-1.9159	-1.9065	-1.7786	-1.9034	-1.8949	
74.04	6: 3	-1.7945	-2.1378	-2.1461	-2.2034	-1.9658	-2.0964	-2.0625	
79.03	6: 4	-1.8467	-2.2521	-2.2201	-2.0647	-2.0366	-2.1549	-2.1123	
84.01	6: 5	-1.6691	-2.0030	-2.1834	-2.1815	-2.1057	-2.3805	-2.1885	
124.03	6: 1	-0.6380		-0.6608	-0.7185	-0.7236	-0.7680	-0.7887	-0.5399
128.96	6: 2	-0.8066		-0.6929	-0.6558	-0.6132	-0.6960	-0.7344	-0.6171
134.04	6: 3	-0.6754		-0.7468	-0.6805	-0.6773	-0.6836	-0.6704	-0.6375
139.03	6: 4	-0.7376		-0.6654	-0.6135	-0.6534	-0.7376	-0.6057	-0.6451
144.01	6: 5	-0.6992		-0.6292	-0.6852	-0.6961	-0.7431	-0.7044	-0.6866

SMOOTH   CYLINDER

REY NO. = 5.907 E+6   K/D = 0.0000   MACH NO. = 0.260
CD = 0.455   CL = 0.124   RUN ID =

THETA	CP	THETA	CP	THETA	CP
0.02	1.0187	120.02	-0.6329	240.02	-0.544
4.91	0.9944	124.91	-0.5713	244.91	-0.5544
9.95	0.9187	129.95	-0.5763	249.95	-0.5998
15.04	0.7954	135.04	-0.5589	255.04	-0.5364
19.93	0.5983	139.93	-0.5980	259.93	-0.9778
20.02	0.6227	140.02	-0.6322	260.02	-1.0959
24.91	0.4021	144.91	-0.6023	264.91	-1.3295
29.95	0.1328	149.95	-0.6329	269.95	-1.6865
35.04	-0.1230	155.04	-0.5751	275.04	-1.7954
39.93	-0.4881	159.93	-0.6061	279.93	-2.0081
40.02	-0.4924	160.02	-0.6222	280.02	-2.0587
44.91	-0.7768	164.91	-0.5672	284.91	-2.0348
49.95	-1.1081	169.95	-0.6097	289.95	-1.9907
55.04	-1.3593	175.04	-0.5144	295.04	-1.7562
59.93	-1.6455	179.93	-0.5334	299.93	-1.5910
60.02	-1.5875	180.02	-0.5362	300.02	-1.6790
64.91	-1.7728	184.91	-0.5258	304.91	-1.3742
69.95	-1.9314	189.95	-0.5360	309.95	-1.1081
75.04	-1.9451	195.04	-0.5116	315.04	-0.7664
79.93	-2.2331	199.93	-0.5349	319.93	-0.4745
80.02	-2.1219	200.02	-0.5499	320.02	-0.5249
84.91	-1.9665	204.91	-0.5529	324.91	-0.1988
89.95	-2.0178	209.95	-0.5650	329.95	0.0988
95.04	-1.4006	215.04	-0.5258	335.04	0.3627
99.93	-1.5824	219.93	-0.5177	339.93	0.5880
100.02		220.02	-0.5607	340.02	0.5692
104.91		224.91	-0.5508	344.91	0.7648
109.95		229.95	-0.5842	349.95	0.9020
115.04		235.04	-0.5165	355.04	0.9854
119.93		239.93	-0.5898	359.93	1.0159

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	7: 1	1.0086		1.0086	1.0093	1.0093	1.0093		1.0028
8.91	7: 2	0.9407		0.9378	0.9407	0.9385	0.9457		0.9508
13.95	7: 3	0.8257		0.8292	0.8307	0.8314	0.8342		0.8573
19.04	7: 4	0.6680		0.6616	0.6609	0.6623	0.6694		0.7184
23.93	7: 5	0.4481		0.4567	0.4660	0.4696	0.4781		0.5474
64.02	7: 1	-1.5388	-1.7351		-1.7882		-1.8406	-1.8212	
68.91	7: 2	-1.5979	-2.0852		-2.1485		-1.8966	-1.9068	
73.95	7: 3	-1.6503	-2.0905		-2.2025		-2.1819	-2.0933	
79.04	7: 4	-1.6206	-2.0752		-2.3389		-2.4004	-2.1767	
83.93	7: 5	-1.4828	-2.1692		-2.2705		-2.4249	-2.2576	
124.02	7: 1	-0.6330		-0.6603	-0.5328	-0.6049	-0.5688	-0.6858	-0.6258
128.91	7: 2	-0.7734		-0.6600	-0.6422	-0.6272	-0.6879	-0.7432	-0.6044
133.95	7: 3	-0.6421		-0.7205	-0.5672	-0.6131	-0.5990	-0.6628	-0.6090
139.04	7: 4	-0.6042		-0.6311	-0.6417	-0.6247	-0.5603	-0.6762	-0.6591
143.93	7: 5	-0.6630		-0.7043	-0.6040	-0.5948	-0.6040	-0.6839	-0.6647

SMOOTH   CYLINDER

REY NO. = 4.929 E+6   K/D = 0.0000   MACH NO. = 0.239
CD = 0.426   CL = 0.111   RUN ID = 8

THETA	CP	THETA	CP	THETA	CP
0.02	1.0160	120.02	-0.5591	240.02	-0.5158
4.95	0.9915	124.95	-0.5690	244.95	-0.5336
9.97	0.9191	129.97	-0.5527	249.97	-0.5340
14.97	0.7974	134.97	-0.5421	254.97	-0.7367
19.95	0.5942	139.95	-0.5690	259.95	-1.0226
20.02	0.6270	140.02	-0.5427	260.02	-0.8608
24.95	0.3953	144.95	-0.5511	264.95	-1.2561
29.97	0.1457	149.97	-0.5492	269.97	-1.5039
34.97	-0.1308	154.97	-0.5283	274.97	-1.9708
39.95	-0.5035	159.95	-0.5989	279.95	-2.0260
40.02	-0.4866	160.02	-0.5451	280.02	-1.9728
44.95	-0.8032	164.95	-0.5344	284.95	-1.9594
49.97	-1.0673	169.97	-0.5032	289.97	-1.9137
54.97	-1.3591	174.97	-0.5169	294.97	-1.8901
59.95	-1.6153	179.95	-0.5280	299.95	-1.6192
60.02	-1.5538	180.02	-0.5055	300.02	-1.6191
64.95	-1.7738	184.95	-0.4749	304.95	-1.3332
69.97	-1.9205	189.97	-0.4817	309.97	-1.0673
74.97	-1.9570	194.97	-0.5435	314.97	-0.8231
79.95	-2.3106	199.95	-0.5254	319.95	-0.4855
80.02	-2.1009	200.02	-0.5003	320.02	-0.5003
84.95	-1.9620	204.95	-0.4970	324.95	-0.1738
89.97	-1.6400	209.97	-0.5066	329.97	0.0961
94.97	-1.3830	214.97	-0.5693	334.97	0.3340
99.95	-1.6646	219.95	-0.5349	339.95	0.5825
100.02		220.02	-0.5124	340.02	0.5771
104.95		224.95	-0.4953	344.95	0.7690
109.97		229.97	-0.5126	349.97	0.8979
114.97		234.97	-0.5864	354.97	0.9825
119.95		239.95	-0.5692	359.95	1.0144

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	8: 1	1.0065		1.0100	1.0091	1.0091	1.0083		1.0066
8.95	8: 2	0.9413		0.9439	0.9464	0.9464	0.9464		0.9559
13.97	8: 3	0.8315		0.8367	0.8478	0.8495	0.8547		0.8748
18.97	8: 4	0.6769		0.6795	0.6872	0.6915	0.6967		0.7437
23.95	8: 5	0.4435		0.4513	0.4590	0.4633	0.4805		0.5499
64.02	8: 1	-1.5038	-1.6383	-1.8633	-1.8211		-1.8185	-1.7889	
68.95	8: 2	-1.6777	-2.1450	-2.2331	-2.1014		-2.0133	-1.8676	
73.97	8: 3	-1.6476	-2.2462	-2.4419	-2.2376		-2.1505	-1.9884	
78.97	8: 4	-1.7531	-2.1084	-2.5140	-2.3739		-2.3445	-2.1695	
83.95	8: 5	-1.4296	-2.1714	-2.6461	-2.4956		-2.4455	-2.2832	
124.02	8: 1	-0.6423		-0.6518	-0.5882	-0.5582	-0.5488	-0.7585	-0.6320
128.95	8: 2	-0.5774		-0.5511	-0.5977	-0.5909	-0.5079	-0.7315	-0.6075
133.97	8: 3	-0.5731		-0.5689	-0.5902	-0.5509	-0.5270	-0.6343	-0.6300
138.97	8: 4	-0.5574		-0.6105	-0.5489	-0.5634	-0.6088	-0.6697	-0.6594
143.95	8: 5	-0.6400		-0.6057	-0.5586	-0.6066	-0.6134	-0.6894	-0.6808

SMOOTH CYLINDER

REY NO. = 3.936 E+6   K/D = 0.0000   MACH NO. = 0.239
CD = 0.416   CL = 0.144   RUN ID = 9

THETA	CP	THETA	CP	THETA	CP
0.01	1.0219	120.01	-0.4906	240.01	-0.5924
4.96	0.9947	124.96	-0.5460	244.96	-0.5201
9.97	0.9170	129.97	-0.5631	249.97	-0.5626
14.97	0.7809	134.97	-0.5445	254.97	-0.8725
19.96	0.5879	139.96	-0.5773	259.96	-1.1060
20.01	0.6557	140.01	-0.5104	260.01	-1.0710
24.96	0.4068	144.96	-0.5405	264.96	-1.2611
29.97	0.1423	149.97	-0.5525	269.97	-1.5314
34.97	-0.1813	154.97	-0.5425	274.97	-2.0625
39.96	-0.5212	159.96	-0.5691	279.96	-2.0230
40.01	-0.4375	160.01	-0.4937	280.01	-2.0687
44.96	-0.8179	164.96	-0.5016	284.96	-1.9621
49.97	-1.0875	169.97	-0.5058	289.97	-1.9323
54.97	-1.3522	174.97	-0.5016	294.97	-1.8827
59.96	-1.6983	179.96	-0.5071	299.96	-1.5981
60.01	-1.5217	180.01	-0.4905	300.01	-1.6400
64.96	-1.7813	184.96	-0.4853	304.96	-1.3688
69.97	-1.9710	189.97	-0.4818	309.97	-1.0875
74.97	-2.2679	194.97	-0.4886	314.97	-0.8051
79.96	-2.4333	199.96	-0.5212	319.96	-0.4714
80.01	-2.0401	200.01	-0.5372	320.01	-0.5001
84.96	-1.9827	204.96	-0.4897	324.96	-0.1898
89.97	-1.7515	209.97	-0.5277	329.97	0.0943
94.97	-2.1443	214.97	-0.5253	334.97	0.3604
99.96	-1.7148	219.96	-0.5569	339.96	0.5974
100.01		220.01	-0.5532	340.01	0.5782
104.96		224.96	-0.5049	344.96	0.7622
109.97		229.97	-0.5168	349.97	0.9007
114.97		234.97	-0.5425	354.97	0.9906
119.96		239.96	-0.5786	359.96	1.0187

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	9: 1	1.0155		1.0176	1.0187	1.0187	1.0208		1.0208
8.96	9: 2	0.9467		0.9533	0.9598	0.9609	0.9609		0.9665
13.97	9: 3	0.8284		0.8372	0.8459	0.8514	0.8547		0.8767
18.97	9: 4	0.6599		0.6718	0.6826	0.6891	0.6912		0.7392
23.96	9: 5	0.4273		0.4436	0.4598	0.4750	0.4837		0.5617
64.01	9: 1	-1.5355	-1.8491	-1.9054	-1.7322		-1.6588	-1.6853	
68.96	9: 2	-1.6714	-2.1329	-2.2385	-2.0284		-1.9598	-1.9556	
73.97	9: 3	-1.7567	-2.3406	-2.4795	-2.2553		-2.1755	-2.1523	
78.97	9: 4	-1.8496	-2.3749	-2.5845	-2.3716		-2.3122	-2.1702	
83.96	9: 5	-1.9192	-2.4984	-2.6950	-2.4756		-2.3921	-2.2901	
124.01	9: 1	-0.5781		-0.9231	-0.5030	-0.4903	-0.4268	-0.7177	-0.5394
128.96	9: 2	-0.5784		-0.6781	-0.5513	-0.5297	-0.4809	-0.5397	-0.6179
133.97	9: 3	-0.5753		-0.5470	-0.5644	-0.5329	-0.5460	-0.5757	-0.6292
138.97	9: 4	-0.5823		-0.5339	-0.5425	-0.5522	-0.5791	-0.6202	-0.6406
143.96	9: 5	-0.6166		-0.5292	-0.5367	-0.5605	-0.5713	-0.6425	-0.6403

SMOOTH   CYLINDER

REY NO. = 2.979 E+6   K/D = 0.0000   MACH NO. = 0.240
CD = 0.363   CL = 0.381   RUN ID = 12

THETA	CP	THETA	CP	THETA	CP
-0.02		119.98		239.98	
4.98	0.9866	124.98	-0.4818	244.98	-0.5039
9.96	0.9071	129.96	-0.4710	249.96	-0.4808
14.95	0.7696	134.95	-0.4497	254.95	-0.5984
19.95	0.5806	139.95	-0.4971	259.95	-1.0196
19.98		139.98		259.98	
24.98	0.3529	144.98	-0.4813	264.98	-1.2461
29.96	0.0829	149.96	-0.4535	269.96	-1.5183
34.95	-0.2225	154.95	-0.4528	274.95	-1.8950
39.95	-0.5508	159.95	-0.4873	279.95	-1.9969
39.98		159.98		279.98	
44.98	-0.7814	164.98	-0.4966	284.98	-1.9576
49.96	-1.0504	169.96	-0.4663	289.96	-1.8636
54.95	-1.3385	174.95	-0.4324	294.95	-1.7858
59.95	-1.7925	179.95	-0.4709	299.95	-1.6015
59.98		179.98		299.98	
64.98	-2.0420	184.98	-0.4615	304.98	-1.3434
69.96	-2.2684	189.96	-0.4431	309.96	-1.0504
74.95	-2.4780	194.95	-0.4193	314.95	-0.7790
79.95	-2.5565	199.95	-0.4401	319.95	-0.4791
79.98		199.98		319.98	
84.98	-2.5447	204.98	-0.4556	324.98	-0.1682
89.96	-2.5280	209.96	-0.4503	329.96	0.1308
94.95	-2.4763	214.95	-0.4368	334.95	0.3778
99.95	-2.0204	219.95	-0.4577	339.95	0.5913
99.98		219.98		339.98	
104.98		224.98	-0.4629	344.98	0.7744
109.96		229.96	-0.4576	349.96	0.9217
114.95		234.95	-0.4310	354.95	0.9985
119.95		239.95	-0.4606	359.95	1.0262

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5
3.98	12: 1							
8.98	12: 2	0.9309		0.9382	0.9353	0.9382	0.94..	
13.96	12: 3	0.8054		0.8156	0.8185	0.8185		
18.95	12: 4	0.6327		0.6443	0.6487	0.653?		
23.95	12: 5	0.4062		0.4194	0.429?	0.435?		
63.98	12: 1							
68.98	12: 2	-1.8574	-2.2499	-2.3495	-2.3583	2.3285		
73.96	12: 3	-2.0114	-2.4238	-2.5356	-2.4920			
78.95	12: 4	-2.1222	-2.5728	-2.6603	2.56??			
83.95	12: 5	-2.2430	-2.6971	-2.733?	2.629?			
123.98	12: 1							
128.98	12: 2	-0.5251		-0.4608				
133.96	12: 3	-0.5215		-0.436?				
138.95	12: 4	-0.5021						
143.95	12: 5	-0.5253						
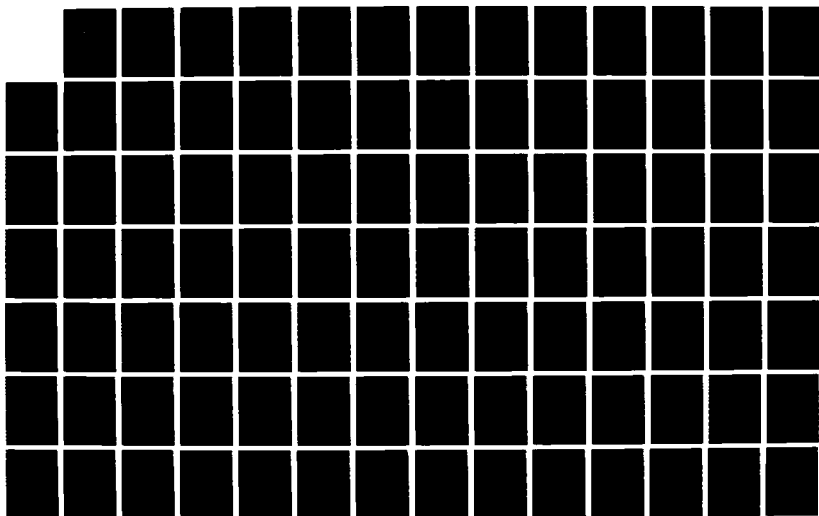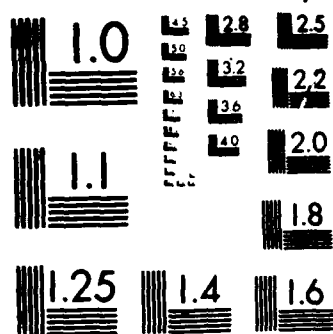
SMOOTH CYLINDER

| REY NO. = 1.992 E+6 | K/D = 0.0000 | MACH NO. = 0.241 |
| CD = 0.295 | CL = -0.169 | RUN ID = 14 |

THETA	CP	THETA	CP	THETA	CP
0.02	1.0234	120.02	-0.3960	240.02	-0.5069
4.96		124.96		244.96	
9.99	0.9269	129.99	-0.3763	249.99	-1.2948
14.99	0.8003	134.99	-0.3617	254.99	-1.5702
19.95	0.6231	139.95	-0.3705	259.95	-2.0099
20.02	0.6772	140.02	-0.3904	260.02	-2.2422
24.96		144.96		264.96	
29.99	0.1636	149.99	-0.3851	269.99	-2.5652
34.99	-0.1389	154.99	-0.3688	274.99	-2.5551
39.95	-0.4557	159.95	-0.3837	279.95	-2.6229
40.02	-0.3612	160.02	-0.3982	280.02	-2.7516
44.96		164.96		284.96	
49.99	-0.9761	169.99	-0.3968	289.99	-2.4143
54.99	-1.2662	174.99	-0.3793	294.99	-2.1422
59.95	-1.5327	179.95	-0.3876	299.95	-1.9172
60.02	-1.5724	180.02	-0.4199	300.02	-1.9875
64.96		184.96		304.96	
69.99	-2.1014	189.99	-0.4056	309.99	-1.3173
74.99	-2.3113	194.99	-0.3989	314.99	-0.9450
79.95	-2.4251	199.95	-0.3854	319.95	-0.6239
80.02	-2.2269	200.02	-0.4156	320.02	-0.6442
84.96		204.96		324.96	
89.99	-2.3028	209.99	-0.4121	329.99	0.0148
94.99	-2.2361	214.99	-0.3989	334.99	0.3111
99.95	-2.0374	219.95	-0.3963	339.95	0.5448
100.02		220.02	-0.4199	340.02	0.5379
104.96		224.96		344.96	
109.99		229.99	-0.4274	349.99	0.8920
114.99		234.99	-0.4033	354.99	0.9905
119.95		239.95	-0.4116	359.95	1.0298

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	14: 1	1.0234		1.0234	1.0190	1.0212	1.0190		0.9973
8.96	14: 2								
13.99	14: 3	0.8350		0.8372	0.8328	0.8284	0.8350		0.8395
18.99	14: 4	0.6692		0.6670	0.6648	0.6626	0.6692		0.7065
23.95	14: 5	0.4591		0.4526	0.4547	0.4547	0.4657		0.5383
64.02	14: 1	-1.4004	-1.7619	-1.9361	-1.9971	-1.9535	-1.9318	-1.8068	
68.96	14: 2								
73.99	14: 3	-1.7972	-2.2327	-2.4515	-2.5040	-2.4515	-2.4340	-2.2569	
78.99	14: 4	-1.8937	-2.3835	-2.6109	-2.6065	-2.5322	-2.5562	-2.3803	
83.95	14: 5	-1.9440	-2.4469	-2.6721	-2.6372	-2.5978	-2.6328	-2.4131	
124.02	14: 1	-0.3491		-0.6597	-0.5923	-0.3773	-0.4403	-0.6503	-0.4851
128.96	14: 2								
133.99	14: 3	-0.3698		-0.4025	-0.4047	-0.3524	-0.3829	-0.5782	-0.5345
138.99	14: 4	-0.3688		-0.4168	-0.3950	-0.3361	-0.4124	-0.5777	-0.5559
143.95	14: 5	-0.3554		-0.3967	-0.4033	-0.3728	-0.4185	-0.5926	-0.5577

SMOOTH CYLINDER

REY NO. = 1.513 E+6		K/D = 0.0000		MACH NO. = 0.243	
CD = 0.312		CL = -0.178		RUN ID = 15	

THETA	CP	THETA	CP	THETA	CP
-0.02		119.98		239.98	
4.97	1.0062	124.97	-0.3442	244.97	-0.9643
9.99	0.9322	129.99	-0.3263	249.99	-1.3624
14.93	0.8096	134.93	-0.3206	254.93	-1.6183
19.93	0.6331	139.93	-0.3178	259.93	-2.2025
19.98		139.98		259.98	
24.97	0.4621	144.97	-0.3450	264.97	-2.5181
29.99	0.1950	149.99	-0.3450	269.99	-2.5357
34.93	-0.1003	154.93	-0.3418	274.93	-2.5727
39.93	-0.4151	159.93	-0.3394	279.93	-2.6014
39.98		159.98		279.98	
44.97	-0.6776	164.97	-0.3643	284.97	-2.5694
49.99	-0.9236	169.99	-0.3530	289.99	-2.3820
54.93	-0.7459	174.93	-0.3473	294.93	-2.1115
59.93	-1.3265	179.93	-0.3449	299.93	-1.8839
59.98		179.98		299.98	
64.97	-1.7915	184.97	-0.3643	304.97	-1.6263
69.99	-2.0480	189.99	-0.3587	309.99	-1.2680
74.93	-2.2361	194.93	-0.3558	314.93	-0.9109
79.93	-2.3439	199.93	-0.3449	319.93	-0.5974
79.98		199.98		319.98	
84.97	-2.2104	204.97	-0.3785	324.97	-0.2844
89.99	-2.2282	209.99	-0.3672	329.99	0.0271
94.93	-2.1770	214.93	-0.3558	334.93	0.3179
99.93	-2.0832	219.93	-0.3478	339.93	0.5562
99.98		219.98		339.98	
104.97		224.97	-0.3814	344.97	0.7413
109.99		229.99	-0.3786	349.99	0.8895
114.93		234.93	-0.3729	354.93	0.9892
119.93		239.93	-0.4160	359.93	1.0262

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.98	15: 1								
8.97	15: 2	0.9635		0.9606	0.9549	0.9521	0.9549		0.9778
13.99	15: 3	0.8467		0.8382	0.8382	0.8296	0.8410		0.8810
18.93	15: 4	0.6843		0.6757	0.6757	0.6729	0.6843		0.7474
23.93	15: 5	0.4736		0.4679	0.4651	0.4594	0.4736		0.5705
63.98	15: 1								
68.97	15: 2	-1.5576	-1.9569	-2.1794	-2.2592	-2.2421	-2.1794	-1.9882	
73.99	15: 3	-1.7147	-2.1734	-2.3985	-2.4326	-2.3814	-2.3557	-2.1684	
78.93	15: 4	-1.8229	-2.3158	-2.5409	-2.5922	-2.5267	-2.5010	-2.3023	
83.93	15: 5	-1.8706	-2.3866	-2.6147	-2.6347	-2.5691	-2.5662	-2.3822	
123.98	15: 1								
128.97	15: 2	-0.3337		-0.4359	-0.4699	-0.3138	-0.3677	-0.5406	-0.4809
133.99	15: 3	-0.3479		-0.3990	-0.3791	-0.3081	-0.3450	-0.5378	-0.5065
138.93	15: 4	-0.3446		-0.3673	-0.3645	-0.3105	-0.3276	-0.5492	-0.4980
143.93	15: 5	-0.3281		-0.3536	-0.3565	-0.3337	-0.3479	-0.5156	-0.5071

SMOOTH CYLINDER

REY NO. = 1.266 E+6   K/D = 0.0000   MACH NO. = 0.243
CD = 0.283   CL = -0.192   RUN ID = 16

THETA	CP	THETA	CP	THETA	CP
-0.02	1.0217	119.98	-0.4387	239.98	-0.5988
4.96	1.0079	124.96	-0.3341	244.96	-0.5939
9.95	0.9431	129.95	-0.3195	249.95	-1.4212
14.93	0.8236	134.93	-0.3357	254.93	-1.7499
19.96	0.6359	139.96	-0.3315	259.96	-2.3753
19.98	0.6737	139.98	-0.3596	259.98	-2.4654
24.96	0.4653	144.96	-0.3467	264.96	-2.4923
29.95	0.2026	149.95	-0.3360	269.95	-2.5923
34.93	-0.0902	154.93	-0.3347	274.93	-2.6070
39.96	-0.4108	159.96	-0.3513	279.96	-2.6353
39.98	-0.1585	159.98	-0.3707	279.98	-2.7657
44.96	-0.6881	164.96	-0.3485	284.96	-2.5811
49.95	-1.0191	169.95	-0.3582	289.95	-2.4114
54.93	-1.3384	174.93	-0.3471	294.93	-2.1534
59.96	-1.4987	179.96	-0.3467	299.96	-1.8924
59.98	-1.5698	179.98	-0.3435	299.98	-1.9527
64.96	-1.7932	184.96	-0.3792	304.96	-1.6232
69.95	-2.0381	189.95	-0.3616	309.95	-1.3058
74.93	-2.2272	194.93	-0.3437	314.93	-0.9428
79.96	-2.3626	199.96	-0.3501	319.96	-0.6018
79.98	-2.2641	199.98	-0.3469	319.98	-0.6224
84.96	-2.2362	204.96	-0.3758	324.96	-0.2820
89.95	-2.2442	209.95	-0.3753	329.95	0.0251
94.93	-2.1637	214.93	-0.3573	334.93	0.3191
99.96	-2.1343	219.96	-0.3671	339.96	0.5680
99.98		219.98	-0.3400	339.98	0.5509
104.96		224.96	-0.3792	344.96	0.7520
109.95		229.95	-0.3685	349.95	0.9022
114.93		234.93	-0.3778	354.93	1.0046
119.96		239.96	-0.5203	359.96	1.0454

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.98	16: 1	1.0148		1.0182	1.0148	1.0148	1.0182		1.0285
8.96	16: 2	0.9635		0.9601	0.9532	0.9567	0.9532		0.9806
13.95	16: 3	0.8543		0.8543	0.8475	0.8509	0.8543		0.8919
18.93	16: 4	0.6938		0.6836	0.6836	0.6801	0.6904		0.7556
23.96	16: 5	0.4756		0.4551	0.4517	0.4517	0.4721		0.5850
63.98	16: 1	-1.4468	-1.7917	-1.9385	-1.9692	-1.9487	-1.8941	-1.7353	
68.96	16: 2	-1.5745	-1.9844	-2.2099	-2.2645	-2.2509	-2.1621	-1.9766	
73.95	16: 3	-1.7239	-2.1781	-2.3898	-2.3966	-2.2873	-2.3147	-2.1691	
78.93	16: 4	-1.7869	-2.2988	-2.5548	-2.5752	-2.5377	-2.5514	-2.3171	
83.96	16: 5	-1.8338	-2.3933	-2.6628	-2.6901	-2.6048	-2.6014	-2.3934	
123.98	16: 1	-0.3664		-0.7882	-0.6760	-0.3426	-0.4140	-0.6498	-0.4864
128.96	16: 2	-0.3399		-0.4556	-0.5033	-0.3433	-0.3671	-0.5462	-0.5121
133.95	16: 3	-0.3394		-0.4041	-0.3939	-0.3496	-0.3496	-0.5456	-0.5286
138.93	16: 4	-0.3245		-0.3687	-0.3619	-0.3347	-0.3585	-0.5174	-0.4969
143.96	16: 5	-0.3173		-0.3513	-0.3649	-0.3207	-0.3309	-0.5373	-0.5135

SMOOTH CYLINDER

REY NO. = 0.891 E+6   K/D = 0.0000   MACH NO. = 0.239
CD = 0.194   CL = 0.026   RUN ID = 18

THETA	CP	THETA	CP	THETA	CP
-0.02	1.0292	119.98	-0.4594	239.98	-0.3624
4.97	1.0094	124.97	-0.3707	244.97	-0.4166
9.98	0.9453	129.98	-0.3263	249.98	-0.9870
14.97	0.8268	134.97	-0.3160	254.97	-1.3165
19.91		139.91		259.91	
19.98	0.5775	139.98	-0.3124	259.98	-1.9528
24.97	0.3516	144.97	-0.3455	264.97	-1.9185
29.98	0.0915	149.98	-0.3267	269.98	-2.2437
34.97	-0.1790	154.97	-0.3272	274.97	-2.5974
39.91		159.91		279.91	
39.98	-0.4387	159.98	-0.3329	279.98	-2.4210
44.97	-0.7922	164.97	-0.3527	284.97	-2.3128
49.98	-1.2045	169.98	-0.3182	289.98	-2.3029
54.97	-1.4656	174.97	-0.3232	294.97	-2.1490
59.91		179.91		299.91	
59.98	-1.7782	179.98	-0.3477	299.98	-1.8524
64.97	-2.0832	184.97	-0.3134	304.97	-1.5630
69.98	-2.2657	189.98	-0.3379	309.98	-1.2831
74.97	-2.3594	194.97	-0.3281	314.97	-0.9696
79.91		199.91		319.91	
79.98	-2.5295	199.98	-0.3280	319.98	-0.5761
84.97	-2.6233	204.97	-0.3380	324.97	-0.2620
89.98	-2.5740	209.98	-0.3625	329.98	0.0129
94.97	-2.1589	214.97	-0.3429	334.97	0.2925
99.91		219.91		339.91	
99.98		219.98	-0.3329	339.98	0.5431
104.97		224.97	-0.3625	344.97	0.7345
109.98		229.98	-0.3674	349.98	0.8818
114.97		234.97	-0.3527	354.97	0.9800
119.91		239.91		359.91	

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.98	18: 1	1.0193		1.0292	1.0242	1.0193	1.0292		0.9113
8.97	18: 2	0.9551		0.9650	0.9650	0.9650	0.9650		0.8769
13.98	18: 3	0.8515		0.8663	0.8663	0.8712	0.8761		0.7886
18.97	18: 4	0.7034		0.6984	0.7083	0.7083	0.7133		0.6755
23.91	18: 5								
63.98	18: 1	-1.7782	-2.0397	-2.0545	-2.0446	-2.0348	-1.9608	-1.8099	
68.97	18: 2	-1.9550	-2.1917	-2.1375	-2.2115	-2.3151	-2.2855	-2.0614	
73.98	18: 3	-2.0980	-2.3791	-2.2706	-2.2953	-2.2459	-2.3298	-2.1944	
78.97	18: 4	-2.1128	-2.3594	-2.5320	-2.4581	-2.3939	-2.4581	-2.3067	
83.91	18: 5								
123.98	18: 1	-0.6367		-0.3369	-0.4401	-0.4794	-0.4647	-0.7706	-0.5247
128.97	18: 2	-0.4388		-0.3897	-0.3504	-0.5517	-0.6450	-0.5740	-0.5346
133.98	18: 3	-0.3464		-0.3955	-0.3218	-0.3955	-0.4200	-0.5739	-0.5592
138.97	18: 4	-0.3075		-0.3960	-0.3125	-0.3763	-0.3862	-0.5641	-0.5592
143.91	18: 5								

SMOOTH   CYLINDER

REY NO. = 0.695 E+6	K/D = 0.0000	MACH NO. = 0.243
CD = 0.158	CL = 0.044	RUN ID = 20

THETA	CP	THETA	CP	THETA	CP
-0.01	1.0148	119.99	-0.3365	239.99	-0.2959
4.96	0.9836	124.96	-0.3408	244.96	-0.3247
9.99	0.9025	129.99	-0.2602	249.99	-0.7137
14.98	0.7835	134.98	-0.2690	254.98	-0.8534
19.97	0.6149	139.97	-0.2555	259.97	-1.3889
19.99	0.6044	139.99	-0.2512	259.99	-1.7630
24.96	0.3743	144.96	-0.2858	264.96	-1.9337
29.99	0.1255	149.99	-0.2745	269.99	-2.2975
34.98	-0.1510	154.98	-0.2838	274.98	-2.3168
39.97	-0.4626	159.97	-0.3011	279.97	-2.2892
39.99	-0.4592	159.99	-0.2397	279.99	-2.2635
44.96	-0.8009	164.96	-0.2749	284.96	-2.1898
49.99	-1.0995	169.99	-0.2457	289.99	-2.2412
54.98	-1.4164	174.98	-0.2786	294.98	-1.9912
59.97	-1.6844	179.97	-0.2589	299.97	-1.7198
59.99	-1.6045	179.99	-0.2210	299.99	-1.7280
64.96	-1.8984	184.96	-0.2562	304.96	-1.4849
69.99	-2.0760	189.99	-0.2644	309.99	-1.2674
74.98	-2.2655	194.98	-0.2661	314.98	-0.9052
79.97	-2.3269	199.97	-0.2901	319.97	-0.5561
79.99	-2.3198	199.99	-0.2460	319.99	-0.5338
84.96	-2.4084	204.96	-0.2935	324.96	-0.2289
89.99	-2.3037	209.99	-0.2894	329.99	0.0260
94.98	-2.0663	214.98	-0.2973	334.98	0.3103
99.97	-1.8136	219.97	-0.3151	339.97	0.5534
99.99		219.99	-0.2460	339.99	0.5795
104.96		224.96	-0.2935	344.96	0.7536
109.99		229.99	-0.3081	349.99	0.8593
114.98		234.98	-0.3286	354.98	0.9649
119.97		239.97	-0.3463	359.97	1.0147

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.99	20: 1	1.0024		1.0024	1.0024	1.0024	0.9775		0.9464
8.96	20: 2	0.9275		0.9399	0.9399	0.9337	0.9399		0.8904
13.99	20: 3	0.8090		0.8277	0.8277	0.8277	0.8277		0.7971
18.98	20: 4	0.6460		0.6647	0.6647	0.6647	0.6772		0.6656
23.97	20: 5	0.4587		0.4649	0.4712	0.4774	0.4837		0.5285
63.99	20: 1	-1.5920	-1.9296	-1.9233	-1.9108	-1.9171	-1.8858	-1.6503	
68.96	20: 2	-1.7796	-2.1172	-2.0485	-2.0422	-2.0547	-2.0360	-1.8712	
73.99	20: 3	-1.8946	-2.2325	-2.2012	-2.2137	-2.1449	-2.1887	-2.0350	
78.98	20: 4	-2.0083	-2.1902	-2.3094	-2.3156	-2.2341	-2.3344	-2.1665	
83.97	20: 5	-2.0698	-2.4523	-2.3833	-2.4209	-2.2830	-2.3708	-2.2642	
123.99	20: 1	-0.3448		-0.2761	-0.3136	-0.4570	-0.5942	-0.6329	-0.4207
128.96	20: 2	-0.3356		-0.3232	-0.3916	-0.3107	-0.4352	-0.5739	-0.4929
133.99	20: 3	-0.2931		-0.3616	-0.3430	-0.3180	-0.3367	-0.5016	-0.5140
138.98	20: 4	-0.2339		-0.3463	-0.2589	-0.3151	-0.3525	-0.5035	-0.5223
143.97	20: 5	-0.2637		-0.3135	-0.2948	-0.3011	-0.3260	-0.4774	-0.4899

SMOOTH CYLINDER

REY NO. = 0.507 E+6	K/D = 0.0000	MACH NO. = 0.243
CD = 0.192	CL = 0.017	RUN ID = 22

THETA	CP	THETA	CP	THETA	CP
0.00	1.0149	120.00	-0.3252	240.00	-0.2978
4.96	1.0489	124.96	-0.2921	244.96	-0.3260
9.95	0.9725	129.95	-0.2655	249.95	-0.8972
14.96	0.8625	134.96	-0.2037	254.96	-1.4525
20.07	0.6929	140.07	-0.2223	260.07	-1.9549
20.00	0.5763	140.00	-0.1838	260.00	-1.8615
24.96	0.3657	144.96	-0.2130	264.96	-1.9810
29.95	0.1623	149.95	-0.2185	269.95	-2.0886
34.96	-0.0972	154.96	-0.2395	274.96	-2.1416
40.07	-0.4171	160.07	-0.2421	280.07	-2.1881
40.00		160.00	-0.1785	280.00	-2.2456
44.96		164.96	-0.2157	284.96	-2.2186
49.95		169.95	-0.2373	289.95	-2.0207
54.96		174.96	-0.2188	294.96	-1.8624
60.07		180.07	-0.2204	300.07	-1.6035
60.00	-1.5149	180.00	-0.1785	300.00	-1.7180
64.96	-1.8046	184.96	-0.1902	304.96	-1.4301
69.95	-2.0275	189.95	-0.2204	309.95	-1.1124
74.96	-2.1863	194.96	-0.2188	314.96	-0.7796
80.07	-2.2147	200.07	-0.2289	320.07	-0.4845
80.00	-2.2115	200.00	-0.1870	320.00	-0.5709
84.96	-2.2780	204.96	-0.2327	324.96	-0.1992
89.95	-2.2412	209.95	-0.2457	329.95	0.1116
94.96	-2.0739	214.96	-0.2357	334.96	0.3746
100.07	-1.9848	220.07	-0.2458	340.07	0.5853
100.00		220.00	-0.2296	340.00	0.5257
104.96		224.96	-0.2412	344.96	0.7535
109.95		229.95	-0.2542	349.95	0.9051
114.96		234.96	-0.2948	354.96	1.0065
120.07		240.07	-0.3558	360.07	1.0149

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	22: 1	0.9979		0.9895	0.9895	0.9725	0.9556		0.9558
8.96	22: 2	1.0064		1.0064	1.0064	1.0064	1.0064		0.9390
13.95	22: 3	0.8792		0.8792	0.8877	0.8792	0.8792		0.8798
18.96	22: 4	0.7354		0.7354	0.7524	0.7439	0.7524		0.7621
24.07	22: 5	0.5319		0.5403	0.5403	0.5319	0.5573		0.5769
64.00	22: 1	-1.4722	-1.7371	-1.7542	-1.7542	-1.7628	-1.6944	-1.4689	
68.96	22: 2	-1.7195	-2.0176	-2.0431	-2.0431	-2.0261	-1.9580	-1.7179	
73.95	22: 3	-1.7981	-2.1465	-2.1720	-2.1805	-2.1975	-2.1380	-1.8935	
78.96	22: 4	-1.8476	-2.1948	-2.2456	-2.2456	-2.3049	-2.2880	-2.0147	
84.07	22: 5	-1.8493	-2.1552	-2.2232	-2.2742	-2.3337	-2.3167	-2.0102	
124.00	22: 1	-0.2859		-0.3199	-0.4049	-0.5239	-0.5579	-0.4257	-0.3319
128.96	22: 2	-0.2469		-0.2723	-0.3061	-0.3400	-0.3908	-0.4109	-0.3939
133.95	22: 3	-0.2523		-0.2523	-0.2692	-0.2946	-0.3452	-0.4403	-0.4065
138.96	22: 4	-0.2395		-0.2395	-0.2479	-0.2900	-0.3237	-0.4385	-0.3963
144.07	22: 5	-0.2421		-0.2421	-0.2758	-0.2927	-0.3433	-0.4404	-0.3896

SMOOTH   CYLINDER

THETA	CP	THETA	CP	THETA	CP
0.00	1.0434	120.00	-0.3303	240.00	-0.3151
4.95	1.0361	124.95	-0.3045	244.95	-0.2672
9.95	0.9648	129.95	-0.2181	249.95	-0.5581
14.95	0.8508	134.95	-0.2451	254.95	-1.1818
20.11	0.6722	140.11	-0.2614	260.11	-1.4274
20.00	0.5601	140.00	-0.2743	260.00	-1.4964
24.95	0.3904	144.95	-0.2567	264.95	-1.9089
29.95	0.1771	149.95	-0.2267	269.95	-2.1706
34.95	-0.0999	154.95	-0.2632	274.95	-2.2879
40.11	-0.4412	160.11	-0.2598	280.11	-2.2148
40.00		160.00	-0.2651	280.00	-2.2333
44.95		164.95	-0.2387	284.95	-2.1727
49.95		169.95	-0.2165	289.95	-2.1208
54.95		174.95	-0.2648	294.95	-1.9605
60.11		180.11	-0.2171	300.11	-1.6373
60.00	-1.6034	180.00	-0.2436	300.00	-1.7556
64.95	-1.8394	184.95	-0.2102	304.95	-1.4327
69.95	-2.0340	189.95	-0.2236	309.95	-1.1787
74.95	-2.1609	194.95	-0.2435	314.95	-0.8311
80.11	-2.2903	200.11	-0.2598	320.11	-0.5122
80.00	-2.2619	200.00	-0.2722	320.00	-0.5551
84.95	-2.2939	204.95	-0.2529	324.95	-0.1984
89.95	-2.2490	209.95	-0.2450	329.95	0.0848
94.95	-2.0673	214.95	-0.2648	334.95	0.3474
100.11	-1.9581	220.11	-0.2740	340.11	0.5815
100.00		220.00	-0.3008	340.00	0.5246
104.95		224.95	-0.2529	344.95	0.7451
109.95		229.95	-0.2877	349.95	0.9011
114.95		234.95	-0.3501	354.95	0.9934
120.11		240.11	-0.2954	360.11	1.0147

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	23: 1	1.0219		1.0290	1.0219	1.0076	1.0219		0.9295
8.95	23: 2	0.9790		0.9933	0.9933	0.9933	1.0076		0.9367
13.95	23: 3	0.8792		0.8792	0.8863	0.8863	0.8863		0.8727
18.95	23: 4	0.7225		0.7368	0.7296	0.7296	0.7510		0.7520
24.11	23: 5	0.5010		0.5153	0.5153	0.5296	0.5367		0.5673
64.00	23: 1	-1.5819	-1.8545	-1.8401	-1.8401	-1.8401	-1.7827	-1.6324	
68.95	23: 2	-1.7609	-2.0820	-2.0820	-2.0535	-2.0463	-2.0107	-1.8304	
73.95	23: 3	-1.8198	-2.1840	-2.1768	-2.1840	-2.1269	-2.1340	-1.9640	
78.95	23: 4	-1.8683	-2.2251	-2.2822	-2.3179	-2.2108	-2.2394	-2.0744	
84.11	23: 5	-2.0191	-2.4117	-2.3189	-2.2832	-2.3117	-2.3117	-2.1292	
124.00	23: 1	-0.3812		-0.3812	-0.3669	-0.4310	-0.6233	-0.6226	-0.4438
128.95	23: 2	-0.2852		-0.2994	-0.3065	-0.2781	-0.4485	-0.5235	-0.4452
133.95	23: 3	-0.2764		-0.2977	-0.3189	-0.2835	-0.3119	-0.5012	-0.4585
138.95	23: 4	-0.3342		-0.3271	-0.3058	-0.2774	-0.2845	-0.4852	-0.4781
144.11	23: 5	-0.2384		-0.2740	-0.2384	-0.2883	-0.2812	-0.4876	-0.4379

SMOOTH   CYLINDER

REY NO. = 0.309 E+6	K/D = 0.0000	MACH NO. = 0.145
CD = 0.980	CL = -0.019	RUN ID = 34

THETA	CP	THETA	CP	THETA	CP
0.02	1.0052	120.02	-0.8186	240.02	-0.7949
5.00	1.0537	125.00	-0.8492	245.00	-0.8003
10.01	0.9917	130.01	-0.8709	250.01	-0.9290
14.99	0.8728	134.99	-0.8608	254.99	-0.8582
20.08	0.7964	140.08	-0.9028	260.08	-0.8981
20.02	0.5157	140.02	-0.9106	260.02	-0.9153
25.00	0.4027	145.00	-0.8907	265.00	-0.9246
30.01	0.1934	150.01	-0.9226	270.01	-0.9711
34.99	-0.0493	154.99	-0.9381	274.99	-0.9370
40.08	-0.2231	160.08	-1.0033	280.08	-0.8596
40.02		160.02	-0.8637	280.02	-0.8946
45.00		165.00	-0.9010	285.00	-0.9435
50.01		170.01	-0.9135	290.01	-1.1698
54.99		174.99	-0.9100	294.99	-1.0826
60.08		180.08	-0.9790	300.08	-0.9892
60.02	-0.9747	180.02	-0.9498	300.02	-1.1967
65.00	-1.0521	185.00	-1.0016	305.00	-0.9591
70.01	-1.1186	190.01	-0.9376	310.01	-0.7734
74.99	-1.0187	194.99	-0.9686	314.99	-0.5575
80.08	-0.9923	200.08	-0.9876	320.08	-0.2231
80.02	-0.9464	200.02	-0.8672	320.02	-0.3650
85.00	-0.8835	205.00	-0.9556	325.00	-0.0490
90.01	-0.9590	210.01	-0.9549	330.01	0.1605
94.99	-0.9630	214.99	-0.9082	334.99	0.3764
100.08	-0.9789	220.08	-0.8654	340.08	0.6423
100.02		220.02	-0.8758	340.02	0.4961
105.00		225.00	-0.8498	345.00	0.7251
110.01		230.01	-0.8843	350.01	0.8336
114.99		234.99	-0.8289	354.99	0.8945
120.08		240.08	-0.7794	360.08	1.0050

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	34: 1	0.9985		1.0052	1.0018	1.0119	1.0119		
9.00	34: 2	1.0084		1.0151	1.0218	1.0285	1.0336		
14.01	34: 3	0.9120		0.9222	0.9239	0.9273	0.9307		
18.99	34: 4	0.7576		0.7660	0.7728	0.7762	0.7813		
24.08	34: 5	0.6597		0.6682	0.6751	0.6802	0.6939		
64.02	34: 1	-1.0074	-1.0195	-1.0453	-1.0023	-0.9558	-1.0023	-1.0604	
69.00	34: 2	-0.9718	-1.0162	-1.0999	-1.0196	-1.0487	-0.9804	-0.9812	
74.01	34: 3	-0.8653	-0.9859	-0.8998	-0.9515	-0.9205	-1.0100	-0.9936	
78.99	34: 4	-0.8341	-0.8962	-0.8927	-0.8824	-0.8617	-0.8824	-0.8903	
84.08	34: 5	-0.8392	-0.9149	-0.9029	-0.9029	-0.8667	-0.8530	-0.8458	
124.02	34: 1	-0.9209		-0.8227	-0.8503	-0.7917	-0.8176		
129.00	34: 2	-0.8105		-0.8549	-0.7934	-0.8395	-0.7404		
134.01	34: 3	-0.8727		-0.7951	-0.8417	-0.8107	-0.8434		
138.99	34: 4	-0.8846		-0.8725	-0.8708	-0.8967	-0.8708		
144.08	34: 5	-0.9482		-0.8638	-0.9447	-0.8276	-0.8586		

SMOOTH   CYLINDER

REY NO. = 0.326 E+6	K/D = 0.0000	MACH NO. = 0.147
CD = 1.009	CL = -0.008	RUN ID = 35

THETA	CP	THETA	CP	THETA	CP
0.00	1.0053	120.00	-0.8315	240.00	-0.8356
4.96	0.8944	124.96	-0.9260	244.96	-0.9121
9.99	0.9862	129.99	-0.8501	249.99	-0.8374
14.98	0.8809	134.98	-0.8525	254.98	-0.8430
20.09	0.6321	140.09	-0.8982	260.09	-0.8773
20.00	0.6576	140.00	-0.8373	260.00	-0.9063
24.96	0.4047	144.96	-0.9552	264.96	-1.0242
29.99	0.3383	149.99	-0.9125	269.99	-0.9604
34.98	0.1002	154.98	-0.9471	274.98	-0.9448
40.09	-0.2463	160.09	-0.9853	280.09	-1.0216
40.00		160.00	-0.8986	280.00	-0.9876
44.96		164.96	-0.9900	284.96	-1.0807
49.99		169.99	-0.9085	289.99	-1.1356
54.98		174.98	-0.8221	294.98	-1.0939
60.09		180.09	-0.9372	300.09	-1.0070
60.00	-0.9332	180.00	-0.9035	300.00	-1.1303
64.96	-1.1377	184.96	-1.0199	304.96	-1.0559
69.99	-1.1688	189.99	-0.9279	309.99	-0.6622
74.98	-1.1002	194.98	-0.9383	314.98	-0.3968
80.09	-1.0881	200.09	-0.9145	320.09	-0.2715
80.00	-0.9461	200.00	-0.8936	320.00	-0.2860
84.96	-1.0275	204.96	-0.9519	324.96	-0.1238
89.99	-0.9928	209.99	-0.9069	329.99	0.2938
94.98	-0.9610	214.98	-0.8753	334.98	0.5448
100.09	-0.9712	220.09	-0.9161	340.09	0.6286
100.00		220.00	-0.8687	340.00	0.6256
104.96		224.96	-0.9386	344.96	0.7042
109.99		229.99	-0.8422	349.99	0.9831
114.98		234.98	-0.8318	354.98	1.0831
120.09		240.09	-0.8805	360.09	1.0054

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	35: 1	0.9796		0.9876	0.9732	0.9651	0.9667		0.9877
8.96	35: 2	0.8623		0.8606	0.8462	0.8317	0.8253		0.8787
13.99	35: 3	0.9128		0.9112	0.9096	0.9048	0.9033		0.9418
18.98	35: 4	0.7614		0.7853	0.7964	0.7980	0.8076		0.8243
24.09	35: 5	0.4913		0.4992	0.5118	0.5087	0.5182		0.5766
64.00	35: 1	-0.9315	-1.0062	-1.0277	-1.0111	-0.9647	-0.9746	-0.9229	
68.96	35: 2	-1.0447	-1.1758	-1.1593	-1.0929	-1.1626	-1.1924	-1.1838	
73.99	35: 3	-0.8696	-1.0378	-1.0022	-0.9844	-0.9407	-1.0168	-0.9928	
78.98	35: 4	-0.8901	-0.8756	-0.9208	-0.8723	-0.8917	-0.8966	-0.9124	
84.09	35: 5	-0.9553	-0.9391	-0.9018	-0.9083	-0.9083	-0.8629	-0.8982	
124.00	35: 1	-0.8207		-0.8240	-0.8091	-0.7577	-0.7991		
128.96	35: 2	-0.8690		-0.8839	-0.8424	-0.9005	-0.9171		
133.99	35: 3	-0.8446		-0.8430	-0.8430	-0.8090	-0.8025		
138.98	35: 4	-0.8987		-0.8987	-0.8599	-0.8632	-0.8309		
144.09	35: 5	-1.0063		-0.8573	-0.8930	-0.9011	-0.8816		

SMOOTH CYLINDER

REY NO. = 0.354 E+6	K/D = 0.0000	MACH NO. = 0.147	
CD = 0.945	CL = 0.010	RUN ID = 36	

THETA	CP	THETA	CP	THETA	CP
0.02		120.02		240.02	
4.97	1.1006	124.97	-0.7908	244.97	-0.7553
9.97	0.9641	129.97	-0.8278	249.97	-0.8339
14.95	0.8785	134.95	-0.8171	254.95	-0.8247
20.09	0.7415	140.09	-0.8792	260.09	-0.8819
20.02		140.02		260.02	
24.97	0.4865	144.97	-0.8592	264.97	-0.9246
29.97	0.1994	149.97	-0.9075	269.97	-1.0156
34.95	0.0089	154.95	-0.8626	274.95	-0.9751
40.09	-0.2285	160.09	-0.8636	280.09	-1.0090
40.02		160.02		280.02	
44.97		164.97	-0.8294	284.97	-0.9989
49.97		169.97	-0.9082	289.97	-1.1974
54.95		174.95	-0.8644	294.95	-1.1332
60.09		180.09	-0.7907	300.09	-1.0414
60.02		180.02		300.02	
64.97	-1.1114	184.97	-0.8250	304.97	-0.8923
69.97	-1.2479	189.97	-0.9171	309.97	-0.7448
74.95	-1.1961	194.95	-0.8055	314.95	-0.5123
80.09	-1.0095	200.09	-0.8437	320.09	-0.2543
80.02		200.02		320.02	
84.97	-1.0331	204.97	-0.8857	324.97	0.0269
89.97	-1.1572	209.97	-0.8399	329.97	0.1979
94.95	-1.0386	214.95	-0.8703	334.95	0.4355
100.09	-0.8984	220.09	-0.8672	340.09	0.6418
100.02		220.02		340.02	
104.97		224.97	-0.7939	344.97	0.8294
109.97		229.97	-0.8324	349.97	0.8812
114.95		234.95	-0.7982	354.95	0.9710
120.09		240.09	-0.8157	360.09	1.0053

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	36: 1								
8.97	36: 2	1.0536		1.0566	1.0581	1.0536	1.0610		0.9663
13.97	36: 3	0.8790		0.8878	0.8981	0.8995	0.9069		0.8120
18.95	36: 4	0.7648		0.7750	0.7852	0.7779	0.7881		0.7233
24.09	36: 5	0.5885		0.6060	0.6104	0.6162	0.6279		0.5802
64.02	36: 1								
68.97	36: 2	-1.0343	-1.1959	-1.1070	-1.1441	-1.2715	-1.0640	-1.1699	
73.97	36: 3	-0.9982	-1.1468	-1.1156	-0.9952	-1.0725	-1.0978	-1.0842	
78.95	36: 4	-0.8913	-0.9296	-0.9222	-0.8766	-0.9340	-0.9016	-0.9722	
84.09	36: 5	-0.9124	-0.9286	-0.9315	-0.9580	-0.9242	-0.8801	-0.8940	
124.02	36: 1								
128.97	36: 2	-0.8177		-0.7835	-0.7806	-0.7910	-0.7554		
133.97	36: 3	-0.8243		-0.8243	-0.7975	-0.8377	-0.8109		
138.95	36: 4	-0.8140		-0.7993	-0.8243	-0.7831	-0.7993		
144.09	36: 5	-0.8533		-0.8297	-0.8165	-0.8253	-0.7841		

SMOOTH CYLINDER

REY NO. = 0.376 E+6   K/D = 0.0000   MACH NO. = 0.147
CD = 0.886   CL = 0.087   RUN ID = 37

THETA	CP	THETA	CP	THETA	CP
0.00		120.00		240.00	
4.96	1.0041	124.96	-0.7757	244.96	-0.7528
9.96	0.9064	129.96	-0.8275	249.96	-0.7447
14.95	0.8170	134.95	-0.7835	254.95	-0.7345
20.09	0.6029	140.09	-0.8236	260.09	-0.8948
20.00		140.00		260.00	
24.96	0.4943	144.96	-0.8013	264.96	-0.8597
29.96	0.2616	149.96	-0.8217	269.96	-1.0267
34.95	0.0348	154.95	-0.8306	274.95	-1.0597
40.09	-0.2837	160.09	-0.8059	280.09	-1.0188
40.00		160.00		280.00	
44.96		164.96	-0.7611	284.96	-1.0863
49.96		169.96	-0.8105	289.96	-1.1741
54.95		174.95	-0.7597	294.95	-1.1340
60.09		180.09	-0.8228	300.09	-1.1150
60.00		180.00		300.00	
64.96	-1.3017	184.96	-0.7611	304.96	-0.8440
69.96	-1.3182	189.96	-0.8021	309.96	-0.7103
74.95	-1.2408	194.95	-0.7919	314.95	-0.4848
80.09	-1.0556	200.09	-0.8440	320.09	-0.2768
80.00		200.00		320.00	
84.96	-1.1689	204.96	-0.7500	324.96	0.0999
89.96	-1.3214	209.96	-0.7895	329.96	0.2891
94.95	-1.0555	214.95	-0.8114	334.95	0.5008
100.09	-1.0344	220.09	-0.8059	340.09	0.6357
100.00		220.00		340.00	
104.96		224.96	-0.7305	344.96	0.8859
109.96		229.96	-0.7587	349.96	0.9627
114.95		234.95	-0.7751	354.95	1.0382
120.09		240.09	-0.7946	360.09	1.0054

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	37: 1								
8.96	37: 2	0.9574		0.9628	0.9683	0.9807	0.9793		1.0041
13.96	37: 3	0.8240		0.8240	0.8034	0.8323	0.8226		0.8940
18.95	37: 4	0.7017		0.7154	0.7236	0.7264	0.7140		0.7922
24.09	37: 5	0.4545		0.4641	0.4627	0.4751	0.4724		0.5849
64.00	37: 1								
68.96	37: 2	-1.2305	-1.4928	-1.4021	-1.4997	-1.6169	-1.4830	-1.6012	
73.96	37: 3	-1.1067	-1.3196	-1.4428	-1.4442	-1.4961	-1.6053	-1.7537	
78.95	37: 4	-0.9527	-1.0394	-0.9443	-0.8968	-0.9079	-1.0604	-1.0415	
84.09	37: 5	-1.1036	-1.0739	-0.9935	-0.9837	-0.9456	-1.1402	-0.9594	
124.00	37: 1								
128.96	37: 2	-0.8055		-0.7678	-0.7804	-0.7748	-0.7497		
133.96	37: 3	-0.7979		-0.7979	-0.7699	-0.8077	-0.7727		
138.95	37: 4	-0.8265		-0.7831	-0.7929	-0.7761	-0.7426		
144.09	37: 5	-0.8708		-0.8285	-0.8214	-0.7904	-0.8214		

SMOOTH   CYLINDER

REY NO. = 0.400 E+6   K/D = 0.0000   MACH NO. = 0.148
    CD = 0.765   CL = 0.342   RUN ID = 39

THETA	CP	THETA	CP	THETA	CP
0.00	1.0054	120.00	-0.7421	240.00	-0.7317
4.98	1.0119	124.98	-0.6753	244.98	-0.6634
9.97	0.9549	129.97	-0.8306	249.97	-0.6738
14.95	0.8290	134.95	-0.8545	254.95	-0.7420
20.09	0.7274	140.09	-0.7986	260.09	-0.7163
20.00	0.4511	140.00	-0.7592	260.00	-0.7515
24.98	0.2913	144.98	-0.7241	264.98	-0.7987
29.97	0.0482	149.97	-0.7258	269.97	-0.9720
34.95	-0.1752	154.95	-0.7402	274.95	-0.9050
40.09	-0.3632	160.09	-0.7649	280.09	-0.9400
40.00		160.00	-0.7115	280.00	-1.0616
44.98		164.98	-0.6687	284.98	-0.9946
49.97		169.97	-0.7005	289.97	-1.0040
54.95		174.95	-0.6197	294.95	-1.1658
60.09		180.09	-0.7638	300.09	-0.9308
60.00	-1.1182	180.00	-0.6926	300.00	-1.1378
64.98	-1.4560	184.98	-0.6259	304.98	-0.8920
69.97	-1.7306	189.97	-0.6232	309.97	-0.6501
74.95	-1.8104	194.95	-0.6104	314.95	-0.3806
80.09	-1.5850	200.09	-0.7030	320.09	-0.2042
80.00	-1.5160	200.00	-0.6966	320.00	-0.2724
84.98	-1.4613	204.98	-0.6433	324.98	0.0105
89.97	-1.6911	209.97	-0.6845	329.97	0.3083
94.95	-1.5036	214.95	-0.6928	334.95	0.5268
100.09	-1.6735	220.09	-0.6991	340.09	0.7094
100.00		220.00	-0.6643	340.00	0.5552
104.98		224.98	-0.6754	344.98	0.7569
109.97		229.97	-0.6938	349.97	0.9311
114.95		234.95	-0.6596	354.95	1.0001
120.09		240.09	-0.6265	360.09	1.0053

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	39: 1	0.9855		0.9895	0.9749	0.9657	0.9630		0.8610
8.98	39: 2	0.9350		0.8992	0.9244	0.8965	0.8979		0.8375
13.97	39: 3	0.8237		0.7693	0.7706	0.7786	0.8011		0.7543
18.95	39: 4	0.6408		0.6235	0.5838	0.5944	0.6182		0.6243
24.09	39: 5	0.5719		0.6049	0.5825	0.4573	0.4086		0.5802
64.00	39: 1	-1.5076	-1.8081	-1.5521	-1.6868	-1.9671	-2.0817	-1.4810	
68.98	39: 2	-1.8153	-2.3689	-2.5285	-2.2456	-2.5486	-2.3448	-2.0984	
73.97	39: 3	-2.0106	-2.7959	-2.9906	-2.9612	-2.8106	-2.5479	-2.2342	
78.95	39: 4	-2.1640	-2.6319	-2.8579	-3.1650	-2.9722	-2.6758	-2.3271	
84.09	39: 5	-1.1066	-1.6946	-0.9506	-1.4859	-2.1889	-2.6528	-1.3894	
124.00	39: 1	-0.8292		-0.7686	-0.7391	-0.8399	-0.7323		
128.98	39: 2	-0.7977		-0.8124	-0.8713	-0.7388	-0.6224		
133.97	39: 3	-0.7311		-0.7604	-0.7085	-0.5901	-0.5834		
138.95	39: 4	-0.7030		-0.7150	-0.6101	-0.5822	-0.5358		
144.09	39: 5	-0.7056		-0.6634	-0.6357	-0.6713	-0.6396		

SMOOTH   CYLINDER

REY NO. = 0.408 E+6   K/D = 0.0000   MACH NO. = 0.147
        CD = 0.725   CL = 0.398   RUN ID =   40

THETA	CP	THETA	CP	THETA	CP
0.00		120.00		240.00	
4.95	0.9596	124.95	-0.7945	244.95	-0.6026
9.97	0.8351	129.97	-0.7534	249.97	-0.6599
14.96	0.7369	134.96	-0.7448	254.96	-0.8141
20.09	0.5999	140.09	-0.6710	260.09	-0.8465
20.00		140.00		260.00	
24.95	0.2873	144.95	-0.7595	264.95	-0.9577
29.97	0.1209	149.97	-0.7811	269.97	-1.1308
34.96	-0.1615	154.96	-0.7593	274.96	-0.8558
40.09	-0.6702	160.09	-0.6805	280.09	-0.8735
40.00		160.00		280.00	
44.95		164.95	-0.7193	284.95	-1.1926
49.97		169.97	-0.6573	289.97	-1.2487
54.96		174.96	-0.6653	294.96	-1.1654
60.09		180.09	-0.6558	300.09	-1.0904
60.00		180.00		300.00	
64.95	-1.5811	184.95	-0.7060	304.95	-0.8531
69.97	-1.8477	189.97	-0.5831	309.97	-0.6522
74.96	-2.0052	194.96	-0.6758	314.96	-0.2696
80.09	-1.1816	200.09	-0.6375	320.09	-0.2084
80.00		200.00		320.00	
84.95	-1.8112	204.95	-0.7060	324.95	0.0396
89.97	-1.5016	209.97	-0.6520	329.97	0.2866
94.96	-1.6382	214.96	-0.6666	334.96	0.5641
100.09	-1.6052	220.09	-0.6167	340.09	0.7227
100.00		220.00		340.00	
104.95		224.95	-0.7286	344.95	0.8437
109.97		229.97	-0.6467	349.97	0.9483
114.96		234.96	-0.6223	354.96	1.0427
120.09		240.09	-0.6493	360.09	1.0053

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	40: 1								
8.95	40: 2	0.8198		0.8446	0.8054	0.8172	0.8381		0.8894
13.97	40: 3	0.7066		0.6897	0.6793	0.6585	0.6975		0.7696
18.96	40: 4	0.6013		0.5381	0.5045	0.4994	0.5445		0.6786
24.09	40: 5	0.4139		0.3562	0.2728	0.4024	0.2613		0.5781
64.00	40: 1								
68.95	40: 2	-2.6140	-2.5476	-2.6711	-2.7441	-2.6034	-2.2715	-1.9970	
73.97	40: 3	-2.1246	-2.5908	-2.7007	-2.9378	-2.7921	-2.5020	-2.2273	
78.96	40: 4	-2.0718	-2.7745	-3.0736	-3.0971	-2.8659	-2.7353	-2.2586	
84.09	40: 5	-1.1895	-2.8561	-2.5123	-2.9359	-1.7712	-2.5607	-0.6553	
124.00	40: 1								
128.95	40: 2	-0.6667		-1.1225	-1.1252	-0.7210	-0.5395		
133.97	40: 3	-0.7586		-0.7045	-0.6741	-0.5367	-0.5261		
138.96	40: 4	-0.7085		-0.6498	-0.5664	-0.5104	-0.5404		
144.09	40: 5	-0.6844		-0.7248	-0.6218	-0.6923	-0.4954		

SMOOTH   CYLINDER

REY NO. = 0.471 E+6   K/D = 0.0000   MACH NO. = 0.149
CD = 0.178   CL = -0.020   RUN ID =   44

THETA	CP	THETA	CP	THETA	CP
0.00		120.00		240.00	
4.98	1.0375	124.98	-0.3339	244.98	-0.9705
10.01	0.9599	130.01	-0.2006	250.01	-1.2010
14.97	0.8388	134.97	-0.1738	254.97	-2.0422
20.09	0.6502	140.09	-0.1664	260.09	-2.0391
20.00		140.00		260.00	
24.98	0.4050	144.98	-0.1961	264.98	-2.2172
30.01	0.1482	150.01	-0.1863	270.01	-2.2774
34.97	-0.1278	154.97	-0.1736	274.97	-2.3702
40.09	-0.4432	160.09	-0.1905	280.09	-2.3442
40.00		160.00		280.00	
44.98		164.98	-0.1697	284.98	-2.3362
50.01		170.01	-0.1790	290.01	-2.1572
54.97		174.97	-0.1688	294.97	-1.9538
60.09		180.09	-0.1767	300.09	-1.6970
60.00		180.00		300.00	
64.98	-1.8966	184.98	-0.1797	304.98	-1.4444
70.01	-2.1083	190.01	-0.1768	310.01	-1.1239
74.97	-2.2575	194.97	-0.1599	314.97	-0.8266
80.09	-2.2634	200.09	-0.1956	320.09	-0.5153
80.00		200.00		320.00	
84.98	-2.3674	204.98	-0.1964	324.98	-0.1888
90.01	-2.3843	210.01	-0.1668	330.01	0.0999
94.97	-2.2325	214.97	-0.1610	334.97	0.3525
100.09	-2.0323	220.09	-0.1600	340.09	0.5710
100.00		220.00		340.00	
104.98		224.98	-0.1653	344.98	0.7650
110.01		230.01	-0.1823	350.01	0.9033
114.97		234.97	-0.2509	354.97	0.9901
120.09		240.09	-0.4016	360.09	1.0055

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	44: 1								
8.98	44: 2	0.9843		0.9920	0.9976	1.0031	1.0065		0.9625
14.01	44: 3	0.8633		0.8722	0.8778	0.8800	0.8944		0.8802
18.97	44: 4	0.7053		0.7119	0.7185	0.7207	0.7351		0.7500
24.09	44: 5	0.4736		0.4802	0.4869	0.4902	0.5122		0.5776
64.00	44: 1								
68.98	44: 2	-1.9444	-2.0900	-2.1100	-2.1044	-2.0633	-1.9488	-1.7633	
74.01	44: 3	-2.1328	-2.2952	-2.2863	-2.3142	-2.2908	-2.1806	-1.9144	
78.97	44: 4	-2.1342	-2.2675	-2.3419	-2.3352	-2.3752	-2.2908	-2.0160	
84.09	44: 5	-2.2545	-2.4461	-2.3993	-2.4294	-2.4717	-2.3670	-2.0590	
124.00	44: 1								
128.98	44: 2	-0.3126		-0.2349	-0.3270	-0.3126	-0.4457		
134.01	44: 3	-0.2274		-0.1929	-0.2196	-0.2740	-0.3606		
138.97	44: 4	-0.2047		-0.1692	-0.1936	-0.2158	-0.3044		
144.09	44: 5	-0.1938		-0.1560	-0.1727	-0.2238	-0.3483		

SMOOTH   CYLINDER

REY NO. = 0.533 E+6   K/D = 0.0000   MACH NO. = 0.076
CD = 0.180   CL = 0.008   RUN ID   =   52

THETA	CP	THETA	CP	THETA	CP
0.03	1.0009	120.03	-0.8554	240.03	-0.7885
4.97		124.97		244.97	
10.01	0.8363	130.01	-0.2963	250.01	-1.4901
14.95	0.7620	134.95	-0.2562	254.95	-2.3817
20.09	0.5110	140.09	-0.2443	260.09	-2.3964
20.03	0.6431	140.03	-0.2550	260.03	-2.4054
24.97		144.97		264.97	
30.01	0.0601	150.01	-0.2636	270.01	-2.6282
34.95	-0.1754	154.95	-0.2631	274.95	-2.6833
40.09	-0.5876	160.09	-0.2535	280.09	-2.7043
40.03		160.03	-0.2298	280.03	-2.6914
44.97		164.97		284.97	
50.01		170.01	-0.2690	290.01	-2.4409
54.95		174.95	-0.2238	294.95	-2.2494
60.09		180.09	-0.2693	300.09	-1.9909
60.03	-1.8288	180.03	-0.2318	300.03	-1.8639
64.97		184.97		304.97	
70.01	-2.3838	190.01	-0.2324	310.01	-1.2949
74.95	-2.5544	194.95	-0.2157	314.95	-0.9174
80.09	-2.6287	200.09	-0.2183	320.09	-0.6540
80.03	-2.6569	200.03	-0.2521	320.03	-0.5571
84.97		204.97		324.97	
90.01	-2.7301	210.01	-0.2527	330.01	0.0119
94.95	-2.5657	214.95	-0.2359	334.95	0.3333
100.09	-2.5534	220.09	-0.2428	340.09	0.5183
100.03		220.03	-0.2197	340.03	0.5908
104.97		224.97		344.97	
110.01		230.01	-0.2446	350.01	0.8823
114.95		234.95	-0.3918	354.95	1.0210
120.09		240.09	-0.6825	360.09	1.0009

CP VS. X/D

	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.03	52: 1	0.9929		1.0090	1.0130	1.0150	1.0230		1.0432
8.97	52: 2								
14.01	52: 3	0.7360		0.7540	0.7560	0.7641	0.7761		0.8542
18.95	52: 4	0.6194		0.6335	0.6395	0.6335	0.6516		0.7797
24.09	52: 5	0.3303		0.3384	0.3444	0.3343	0.3544		0.5304
64.03	52: 1	-1.9556	-2.0844	-2.0723	-2.0642	-2.0602	-1.9938	-1.8353	
68.97	52: 2								
74.01	52: 3	-2.3737	-2.5051	-2.5394	-2.5091	-2.5253	-2.4545	-2.2515	
78.95	52: 4	-2.4760	-2.6448	-2.6468	-2.6448	-2.6950	-2.6267	-2.3244	
84.09	52: 5	-2.5741	-2.6792	-2.7277	-2.7135	-2.7903	-2.7539	-2.4740	
124.03	52: 1	-0.7594		-0.6257	-0.6216	-0.8343	-1.0875		
128.97	52: 2								
134.01	52: 3	-0.2473		-0.2798	-0.2656	-0.2961	-0.4038		
138.95	52: 4	-0.2429		-0.2510	-0.2631	-0.2834	-0.3421		
144.09	52: 5	-0.2535		-0.2616	-0.2474	-0.2881	-0.3268		

SMOOTH CYLINDER

REY NO. = 0.469 E+6	K/D = 0.0000	MACH NO. = 0.067
CD = 0.195	CL = -0.052	RUN ID = 53

THETA	CP	THETA	CP	THETA	CP
0.00	1.0001	120.00	-0.9567	240.00	-0.9042
4.97	1.0210	124.97	-0.5379	244.97	-1.3504
9.96	1.0001	129.96	-0.3963	249.96	-2.2530
14.94	0.7938	134.94	-0.2849	254.94	-2.3733
20.08	0.6241	140.08	-0.2765	260.08	-2.4630
20.00	0.5298	140.00	-0.2652	260.00	-2.4988
24.97	0.3349	144.97	-0.2626	264.97	-2.5735
29.96	0.1011	149.96	-0.2693	269.96	-2.6905
34.94	-0.2627	154.94	-0.2492	274.94	-2.7470
40.08	-0.5851	160.08	-0.2853	280.08	-2.7797
40.00		160.00	-0.2483	280.00	-2.7893
44.97		164.97	-0.2593	284.97	-2.6894
49.96		169.96	-0.2739	289.96	-2.5225
54.94		174.94	-0.2594	294.94	-2.2783
60.08		180.08	-0.2401	300.08	-2.0058
60.00	-1.8743	180.00	-0.2589	300.00	-2.0140
64.97	-2.1723	184.97	-0.2540	304.97	-1.6762
69.96	-2.4206	189.96	-0.2450	309.96	-1.3020
74.94	-2.5272	194.94	-0.2462	314.94	-1.0032
80.08	-2.7341	200.08	-0.2585	320.08	-0.6631
80.00	-2.6995	200.00	-0.2562	320.00	-0.7148
84.97	-2.7842	204.97	-0.2409	324.97	-0.3381
89.96	-2.7850	209.96	-0.2686	329.96	0.0231
94.94	-2.5996	214.94	-0.2462	334.94	0.2674
100.08	-2.5323	220.08	-0.2795	340.08	0.5167
100.00		220.00	-0.2615	340.00	0.4648
104.97		224.97	-0.2435	344.97	0.7195
109.96		229.96	-0.2712	349.96	0.9066
114.94		234.94	-0.3908	354.94	0.9637
120.08		240.08	-1.0205	360.08	1.0001

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	53: 1	0.9897		0.9949	0.9897	0.9818	0.9792		0.9455
8.97	53: 2	0.9687		0.9792	0.9818	0.9818	0.9818		0.9403
13.96	53: 3	0.8956		0.8956	0.8956	0.8956	0.9008		0.9013
18.94	53: 4	0.6502		0.6737	0.6763	0.6867	0.6972		0.6909
24.08	53: 5	0.4414		0.4414	0.4466	0.4466	0.4727		0.5323
64.00	53: 1	-1.9582	-2.0892	-2.0970	-2.0970	-2.0735	-2.0210	-1.8413	
68.97	53: 2	-2.2297	-2.3159	-2.3681	-2.3368	-2.3498	-2.2950	-2.0416	
73.96	53: 3	-2.4258	-2.5430	-2.5325	-2.5690	-2.5742	-2.5117	-2.2652	
78.94	53: 4	-2.5272	-2.6552	-2.7152	-2.7231	-2.6735	-2.6343	-2.3731	
84.08	53: 5	-2.6036	-2.7654	-2.7393	-2.7707	-2.7758	-2.7393	-2.4086	
124.00	53: 1	-0.7660		-0.6738	-0.7239	-0.7687	-1.0771		
128.97	53: 2	-0.3941		-0.3520	-0.3468	-0.4310	-0.7650		
133.96	53: 3	-0.2955		-0.2588	-0.3008	-0.3454	-0.5132		
138.94	53: 4	-0.2729		-0.2623	-0.2702	-0.2886	-0.3570		
144.08	53: 5	-0.2643		-0.2590	-0.2617	-0.2958	-0.3615		

SMOOTH   CYLINDER

REY NO. = 0.444 E+6	K/D = 0.0000	MACH NO. = 0.063
CD = 0.218	CL = -0.030	RUN ID = 54

THETA	CP	THETA	CP	THETA	CP
0.00	1.0004	120.00	-0.9897	240.00	-0.8839
4.95	0.9770	124.95	-0.6440	244.95	-1.2828
9.99	0.9421	129.99	-0.3295	249.99	-2.0932
14.95	0.7437	134.95	-0.2849	254.95	-2.4069
20.11	0.5686	140.11	-0.2639	260.11	-2.4397
20.00	0.5750	140.00	-0.2660	260.00	-2.4460
24.95	0.3566	144.95	-0.2798	264.95	-2.5832
29.99	0.1292	149.99	-0.2690	269.99	-2.6480
34.95	-0.2377	154.95	-0.2856	274.95	-2.7877
40.11	-0.5756	160.11	-0.2943	280.11	-2.7601
40.00		160.00	-0.2656	280.00	-2.7409
44.95		164.95	-0.2795	284.95	-2.6303
49.99		169.99	-0.2423	289.99	-2.4714
54.95		174.95	-0.2531	294.95	-2.2748
60.11		180.11	-0.2532	300.11	-1.9939
60.00	-1.8853	180.00	-0.2450	300.00	-1.9423
64.95	-2.1793	184.95	-0.2560	304.95	-1.6185
69.99	-2.3921	189.99	-0.2394	309.99	-1.2518
74.95	-2.5555	194.95	-0.2531	314.95	-0.9950
80.11	-2.6833	200.11	-0.2738	320.11	-0.6455
80.00	-2.7556	200.00	-0.2539	320.00	-0.6341
84.95	-2.8160	204.95	-0.2471	324.95	-0.2843
89.99	-2.7186	209.99	-0.2276	329.99	0.0593
94.95	-2.6226	214.95	-0.2678	334.95	0.2721
100.11	-2.4978	220.11	-0.2415	340.11	0.5256
100.00		220.00	-0.2539	340.00	0.5255
104.95		224.95	-0.2442	344.95	0.7528
109.99		229.99	-0.2717	349.99	0.9392
114.95		234.95	-0.5355	354.95	0.9713
120.11		240.11	-0.9919	360.11	1.0004

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	54: 1	0.9887		0.9858	0.9858	0.9916	1.0004		1.0004
8.95	54: 2	0.9245		0.9421	0.9479	0.9537	0.9654		0.9596
13.99	54: 3	0.8428		0.8574	0.8604	0.8662	0.8691		0.9130
18.95	54: 4	0.6095		0.6211	0.6241	0.6270	0.6328		0.7208
24.11	54: 5	0.3819		0.3819	0.3936	0.3936	0.4140		0.5460
64.00	54: 1	-1.9905	-2.1134	-2.1104	-2.1250	-2.1075	-2.0402	-1.8771	
68.95	54: 2	-2.2319	-2.3605	-2.3488	-2.3605	-2.3020	-2.2231	-2.0409	
73.99	54: 3	-2.3776	-2.4825	-2.5176	-2.5176	-2.4884	-2.4184	-2.1890	
78.95	54: 4	-2.4853	-2.6228	-2.6024	-2.6521	-2.6550	-2.5731	-2.3485	
84.11	54: 5	-2.5341	-2.7184	-2.7213	-2.7009	-2.7535	-2.6482	-2.3682	
124.00	54: 1	-0.6547		-0.7195	-0.6753	-0.9256	-1.1171		
128.95	54: 2	-0.3857		-0.3799	-0.4564	-0.5270	-0.6388		
133.99	54: 3	-0.2777		-0.2836	-0.2954	-0.3071	-0.4159		
138.95	54: 4	-0.2827		-0.2738	-0.2915	-0.3209	-0.4592		
144.11	54: 5	-0.2795		-0.2678	-0.2913	-0.3443	-0.4885		

SMOOTH   CYLINDER

REY NO. = 0.427 E+6	K/D = 0.0000	MACH NO. = 0.060
CD = 0.243	CL = -0.056	RUN ID = 55

THETA	CP	THETA	CP	THETA	CP
0.00	0.9937	120.00	-1.0410	240.00	-0.9375
4.98	0.9871	124.98	-0.5563	244.98	-1.3280
10.00	0.8950	130.00	-0.4105	250.00	-2.3329
14.96	0.7495	134.96	-0.3088	254.96	-2.4338
20.09	0.5811	140.09	-0.2593	260.09	-2.4653
20.00	0.5910	140.00	-0.3008	260.00	-2.4700
24.98	0.3615	144.98	-0.3170	264.98	-2.6172
30.00	0.0613	150.00	-0.3088	270.00	-2.7887
34.96	-0.2377	154.96	-0.3098	274.96	-2.8077
40.09	-0.5684	160.09	-0.2947	280.09	-2.7519
40.00		160.00	-0.2791	280.00	-2.7444
44.98		164.98	-0.2821	284.98	-2.6747
50.00		170.00	-0.2955	290.00	-2.5515
54.96		174.96	-0.3002	294.96	-2.3118
60.09		180.09	-0.2916	300.09	-1.9958
60.00	-1.8696	180.00	-0.2633	300.00	-1.9120
64.98	-2.1586	184.98	-0.3044	304.98	-1.6576
70.00	-2.4329	190.00	-0.3115	310.00	-1.3654
74.96	-2.5741	194.96	-0.2874	314.96	-0.9974
80.09	-2.6982	200.09	-0.2821	320.09	-0.6222
80.00	-2.7350	200.00	-0.2539	320.00	-0.6106
84.98	-2.8152	204.98	-0.2630	324.98	-0.3052
90.00	-2.8079	210.00	-0.3083	330.00	-0.0179
94.96	-2.6381	214.96	-0.2811	334.96	0.2908
100.09	-2.5340	220.09	-0.2725	340.09	0.5721
100.00		220.00	-0.2539	340.00	0.5536
104.98		224.98	-0.2885	344.98	0.7501
110.00		230.00	-0.3851	350.00	0.8793
114.96		234.96	-0.5525	354.96	0.9840
120.09		240.09	-0.9374	360.09	1.0378

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	55: 1	0.9874		0.9968	1.0030	1.0093	1.0124		1.0061
8.98	55: 2	0.9270		0.9365	0.9397	0.9365	0.9397		0.9713
14.00	55: 3	0.7903		0.8061	0.7966	0.7966	0.7966		0.8634
18.96	55: 4	0.6037		0.6227	0.6290	0.6290	0.6480		0.7244
24.09	55: 5	0.3845		0.3908	0.4035	0.4162	0.4416		0.5563
64.00	55: 1	-1.9636	-2.0826	-2.0826	-2.0952	-2.0451	-1.9511	-1.8391	
68.98	55: 2	-2.2125	-2.3647	-2.3583	-2.3583	-2.3330	-2.2378	-2.0196	
74.00	55: 3	-2.4202	-2.5825	-2.5825	-2.5952	-2.5538	-2.4870	-2.2406	
78.96	55: 4	-2.5487	-2.6980	-2.6821	-2.6980	-2.6916	-2.5773	-2.3597	
84.09	55: 5	-2.5869	-2.7586	-2.7650	-2.7682	-2.7936	-2.6632	-2.3707	
124.00	55: 1	-0.6126		-0.5465	-0.8488	-0.9338	-0.7795		
128.98	55: 2	-0.3712		-0.4318	-0.3999	-0.5529	-0.6167		
134.00	55: 3	-0.3216		-0.3408	-0.3633	-0.3984	-0.5392		
138.96	55: 4	-0.3098		-0.3098	-0.3066	-0.3417	-0.4248		
144.09	55: 5	-0.2819		-0.3010	-0.3075	-0.3266	-0.4289		

REY NO. = 0.423 E+6		K/D = 0.0000		MACH NO. = 0.060	
CD = 0.242		CL = -0.041		RUN ID = 56	

THETA	CP	THETA	CP	THETA	CP
0.02	0.9900	120.02	-1.0795	240.02	-0.9594
4.96	0.9738	124.96	-0.6896	244.96	-1.3049
10.00	0.8706	130.00	-0.3948	250.00	-2.3393
14.95	0.7864	134.95	-0.2983	254.95	-2.3953
20.09	0.5743	140.09	-0.2686	260.09	-2.4712
20.02	0.5696	140.02	-0.3472	260.02	-2.4970
24.96	0.3416	144.96	-0.3253	264.96	-2.6495
30.00	0.0295	150.00	-0.3436	270.00	-2.7569
34.95	-0.2136	154.95	-0.2960	274.95	-2.8256
40.09	-0.5576	160.09	-0.3023	280.09	-2.7759
40.02		160.02	-0.3053	280.02	-2.8085
44.96		164.96	-0.3089	284.96	-2.6984
50.00		170.00	-0.3236	290.00	-2.5516
54.95		174.95	-0.2731	294.95	-2.2843
60.09		180.09	-0.2666	300.09	-2.0150
60.02	-1.9311	180.02	-0.2794	300.02	-1.9592
64.96	-2.2127	184.96	-0.2893	304.96	-1.6779
70.00	-2.4774	190.00	-0.3171	310.00	-1.3628
74.95	-2.5629	194.95	-0.2763	314.95	-0.9816
80.09	-2.7012	200.09	-0.2634	320.09	-0.6348
80.02	-2.7857	200.02	-0.3021	320.02	-0.6402
84.96	-2.8908	204.96	-0.2959	324.96	-0.3068
90.00	-2.8286	210.00	-0.3268	330.00	-0.0059
94.95	-2.6495	214.95	-0.2698	334.95	0.3156
100.09	-2.4963	220.09	-0.2601	340.09	0.5492
100.02		220.02	-0.3053	340.02	0.5343
104.96		224.96	-0.2991	344.96	0.7480
110.00		230.00	-0.3561	350.00	0.8804
114.95		234.95	-0.5953	354.95	1.0094
120.09		240.09	-0.9419	360.09	1.0447

					CP	VS.	X/D				
THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	56: 1	0.9772		0.9868	0.9900	0.9964	1.0093		0.9932
8.96	56: 2	0.9157		0.9319	0.9415	0.9480	0.9544		0.9513
14.00	56: 3	0.7673		0.7770	0.7931	0.7996	0.8093		0.8482
18.95	56: 4	0.6313		0.6410	0.6475	0.6604	0.6765		0.7512
24.09	56: 5	0.3939		0.4132	0.4197	0.4164	0.4293		0.5589
64.02	56: 1	-2.0148	-2.1436	-2.1565	-2.1243	-2.0985	-2.0148	-1.8548	
68.96	56: 2	-2.2807	-2.4006	-2.4006	-2.3746	-2.3746	-2.2289	-2.0951	
74.00	56: 3	-2.5033	-2.6262	-2.6003	-2.6035	-2.5873	-2.4903	-2.2845	
78.95	56: 4	-2.5241	-2.6730	-2.6698	-2.6763	-2.6698	-2.5629	-2.3364	
84.09	56: 5	-2.6010	-2.7367	-2.7496	-2.7464	-2.7529	-2.6463	-2.4052	
124.02	56: 1	-0.7163		-0.6936	-0.7649	-0.9494	-1.0271		
128.96	56: 2	-0.4230		-0.4295	-0.4099	-0.5630	-0.5793		
134.00	56: 3	-0.3598		-0.3696	-0.3794	-0.4119	-0.5485		
138.95	56: 4	-0.2732		-0.2895	-0.3025	-0.3123	-0.4393		
144.09	56: 5	-0.2893		-0.2893	-0.2959	-0.3088	-0.4614		

SMOOTH CYLINDER

REY NO. = 0.406 E+6	K/D = 0.0000	MACH NO. = 0.057
CD = 0.254	CL = -0.055	RUN ID = 57

THETA	CP	THETA	CP	THETA	CP
0.02	0.9756	120.02	-1.1017	240.02	-0.9741
4.98	0.9722	124.98	-0.7218	244.98	-1.3278
10.00	0.8981	130.00	-0.4705	250.00	-2.4259
14.95	0.7640	134.95	-0.3465	254.95	-2.4984
20.13	0.5562	140.13	-0.3271	260.13	-2.4803
20.02	0.5666	140.02	-0.3692	260.02	-2.5624
24.98	0.3393	144.98	-0.3374	264.98	-2.6883
30.00	0.0494	150.00	-0.3501	270.00	-2.8544
34.95	-0.2511	154.95	-0.3189	274.95	-2.9084
40.13	-0.5901	160.13	-0.3425	280.13	-2.8317
40.02		160.02	-0.3337	280.02	-2.8581
44.98		164.98	-0.3270	284.98	-2.8124
50.00		170.00	-0.3111	290.00	-2.6448
54.95		174.95	-0.3223	294.95	-2.3668
60.13		180.13	-0.3149	300.13	-2.0681
60.02	-1.9720	180.02	-0.3231	300.02	-2.0043
64.98	-2.2326	184.98	-0.3128	304.98	-1.7003
70.00	-2.4564	190.00	-0.3111	310.00	-1.3806
74.95	-2.6259	194.95	-0.3366	314.95	-1.0443
80.13	-2.7459	200.13	-0.3149	320.13	-0.6733
80.02	-2.8118	200.02	-0.3480	320.02	-0.6712
84.98	-2.9541	204.98	-0.3128	324.98	-0.3289
90.00	-2.8793	210.00	-0.3218	330.00	-0.0140
94.95	-2.7409	214.95	-0.3259	334.95	0.2706
100.13	-2.5585	220.13	-0.3114	340.13	0.5153
100.02		220.02	-0.3302	340.02	0.5207
104.98		224.98	-0.3128	344.98	0.7401
110.00		230.00	-0.3609	350.00	0.8841
114.95		234.95	-0.6601	354.95	0.9862
120.13		240.13	-0.9760	360.13	1.0109

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	57: 1	0.9650		0.9756	0.9862	0.9898	0.9898		0.9862
8.98	57: 2	0.9158		0.9369	0.9405	0.9369	0.9440		0.9546
14.00	57: 3	0.7888		0.7923	0.7994	0.8099	0.8135		0.8595
18.95	57: 4	0.6052		0.6088	0.6123	0.6158	0.6299		0.7360
24.13	57: 5	0.3722		0.3757	0.3757	0.3827	0.4035		0.5361
64.02	57: 1	-2.0746	-2.1773	-2.1525	-2.1808	-2.1383	-2.0569	-1.9069	
68.98	57: 2	-2.2679	-2.4162	-2.4409	-2.4267	-2.3455	-2.2467	-2.1391	
74.00	57: 3	-2.4706	-2.6190	-2.6332	-2.5978	-2.5872	-2.4706	-2.2895	
78.95	57: 4	-2.6082	-2.7639	-2.7355	-2.7497	-2.7497	-2.6542	-2.3383	
84.13	57: 5	-2.6206	-2.8189	-2.8259	-2.7807	-2.7946	-2.6798	-2.3483	
124.02	57: 1	-0.7960		-0.6680	-0.8031	-1.0166	-0.8743		
128.98	57: 2	-0.4368		-0.5078	-0.5007	-0.5184	-0.6071		
134.00	57: 3	-0.3750		-0.3750	-0.3678	-0.4318	-0.5668		
138.95	57: 4	-0.3474		-0.3367	-0.3581	-0.3936	-0.5572		
144.13	57: 5	-0.3215		-0.3285	-0.3285	-0.3740	-0.5594		

SMOOTH   CYLINDER

REY NO. = 0.404 E+6   K/D = 0.0000   MACH NO. = 0.057
CD = 0.254   CL = -0.040   RUN ID = 58

THETA	CP	THETA	CP	THETA	CP
0.02	0.9930	120.02	-1.1700	240.02	-0.9769
4.99	0.9544	124.99	-0.6939	244.99	-1.3348
9.95	0.9227	129.95	-0.4141	249.95	-2.2750
14.99	0.7706	134.99	-0.3348	254.99	-2.4575
20.11	0.5563	140.11	-0.3233	260.11	-2.4649
20.02	0.5615	140.02	-0.3605	260.02	-2.6580
24.99	0.3265	144.99	-0.3527	264.99	-2.6128
29.95	0.0876	149.95	-0.2982	269.95	-2.7728
34.99	-0.2425	154.99	-0.3110	274.99	-2.8554
40.11	-0.6022	160.11	-0.3360	280.11	-2.8294
40.02		160.02	-0.3710	280.02	-2.9193
44.99		164.99	-0.3452	284.99	-2.7305
49.95		169.95	-0.3119	289.95	-2.5554
54.99		174.99	-0.3079	294.99	-2.3341
60.11		180.11	-0.3353	300.11	-2.0447
60.02	-1.9957	180.02	-0.3565	300.02	-2.0637
64.99	-2.2324	184.99	-0.3345	304.99	-1.7023
69.95	-2.3813	189.95	-0.3190	309.95	-1.3573
74.99	-2.5821	194.99	-0.3222	314.99	-1.0298
80.11	-2.7587	200.11	-0.3244	320.11	-0.6701
80.02	-2.9447	200.02	-0.3710	320.02	-0.7080
84.99	-2.8625	204.99	-0.3345	324.99	-0.3404
89.95	-2.7763	209.95	-0.3226	329.95	-0.0146
94.99	-2.6590	214.99	-0.3115	334.99	0.2624
100.11	-2.5546	220.11	-0.3244	340.11	0.5424
100.02		220.02	-0.3674	340.02	0.5004
104.99		224.99	-0.3132	344.99	0.7216
109.95		229.95	-0.3653	349.95	0.8911
114.99		234.99	-0.5967	354.99	0.9686
120.11		240.11	-0.8984	360.11	1.0217

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	58: 1	0.9786		0.9822	0.9786	0.9786	0.9750		0.9930
8.99	58: 2	0.8944		0.9085	0.9121	0.9191	0.9191		0.9298
13.95	58: 3	0.8133		0.8098	0.8098	0.8098	0.8239		0.8841
18.99	58: 4	0.6186		0.6115	0.6115	0.6115	0.6257		0.7285
24.11	58: 5	0.3629		0.3736	0.3736	0.3951	0.4202		0.5352
64.02	58: 1	-2.1112	-2.2194	-2.2303	-2.2375	-2.1834	-2.0931	-1.9684	
68.99	58: 2	-2.2749	-2.3811	-2.4095	-2.3989	-2.3811	-2.2608	-2.0564	
73.95	58: 3	-2.4025	-2.5617	-2.5511	-2.5476	-2.5228	-2.3565	-2.1243	
78.99	58: 4	-2.5395	-2.6919	-2.7061	-2.7451	-2.7167	-2.5821	-2.2770	
84.11	58: 5	-2.6869	-2.8125	-2.7946	-2.8556	-2.8305	-2.6618	-2.3521	
124.02	58: 1	-0.8069		-0.7343	-0.8613	-0.9883	-0.8685		
128.99	58: 2	-0.4666		-0.4951	-0.5414	-0.6090	-0.5735		
133.95	58: 3	-0.3195		-0.3409	-0.3729	-0.4334	-0.4761		
138.99	58: 4	-0.3217		-0.3288	-0.3787	-0.4143	-0.5426		
144.11	58: 5	-0.3432		-0.3179	-0.3432	-0.3974	-0.5527		

SMOOTH CYLINDER

REY NO. = 0.395 E+6		K/D = 0.0000		MACH NO. = 0.056	
CD = 0.260		CL = -0.049		RUN ID = 59	

THETA	CP	THETA	CP	THETA	CP
0.00	0.9963	120.00	-1.1455	240.00	-0.9271
4.98	0.9703	124.98	-0.7189	244.98	-1.3504
9.99	0.8925	129.99	-0.4276	249.99	-2.3528
14.94	0.7701	134.94	-0.4013	254.94	-2.4980
20.07	0.5557	140.07	-0.3014	260.07	-2.4564
20.00	0.5745	140.00	-0.3449	260.00	-2.5807
24.98	0.3485	144.98	-0.3452	264.98	-2.7180
29.99	0.0675	149.99	-0.3262	269.99	-2.8082
34.94	-0.2221	154.94	-0.3164	274.94	-2.8898
40.07	-0.5868	160.07	-0.3361	280.07	-2.8145
40.00		160.00	-0.3258	280.00	-2.9059
44.98		164.98	-0.3079	284.98	-2.7890
49.99		169.99	-0.3367	289.99	-2.5765
54.94		174.94	-0.2968	294.94	-2.4265
60.07		180.07	-0.3177	300.07	-2.0478
60.00	-1.9346	180.00	-0.3295	300.00	-2.0006
64.98	-2.2178	184.98	-0.3116	304.98	-1.6727
69.99	-2.4286	189.99	-0.3367	309.99	-1.3460
74.94	-2.5987	194.94	-0.3117	314.94	-1.0183
80.07	-2.7127	200.07	-0.3177	320.07	-0.6386
80.00	-2.8423	200.00	-0.3482	320.00	-0.6908
84.98	-2.8936	204.98	-0.3190	324.98	-0.3179
89.99	-2.8456	209.99	-0.3142	329.99	-0.0102
94.94	-2.7142	214.94	-0.3117	334.94	0.2704
100.07	-2.5677	220.07	-0.2952	340.07	0.5709
100.00		220.00	-0.3408	340.00	0.5153
104.98		224.98	-0.3414	344.98	0.7335
109.99		229.99	-0.3702	349.99	0.8705
114.94		234.94	-0.5472	354.94	0.9889
120.07		240.07	-0.8925	360.07	1.0481

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	59: 1	0.9852		0.9852	0.9814	0.9814	0.9852		0.9963
8.98	59: 2	0.9185		0.9259	0.9333	0.9333	0.9444		0.9593
13.99	59: 3	0.7851		0.7925	0.7962	0.8036	0.8184		0.8594
18.94	59: 4	0.6255		0.6255	0.6366	0.6366	0.6477		0.7370
24.07	59: 5	0.3595		0.3780	0.4002	0.4150	0.4447		0.5487
64.00	59: 1	-2.0386	-2.1612	-2.1723	-2.1574	-2.1389	-1.9903	-1.8631	
68.98	59: 2	-2.2883	-2.3924	-2.4073	-2.3924	-2.3032	-2.1769	-2.0715	
73.99	59: 3	-2.4212	-2.5587	-2.5884	-2.5772	-2.5141	-2.3729	-2.1878	
78.94	59: 4	-2.5355	-2.6916	-2.7214	-2.7028	-2.6767	-2.5169	-2.3294	
84.07	59: 5	-2.6384	-2.8055	-2.8129	-2.8240	-2.7572	-2.5568	-2.2947	
124.00	59: 1	-0.7184		-0.7856	-0.8305	-1.0471	-0.7184		
128.98	59: 2	-0.4685		-0.4798	-0.4798	-0.5993	-0.5470		
133.99	59: 3	-0.3449		-0.3673	-0.3710	-0.4270	-0.5466		
138.94	59: 4	-0.3089		-0.3051	-0.3463	-0.3837	-0.6006		
144.07	59: 5	-0.3324		-0.3324	-0.3473	-0.3510	-0.5451		

SMOOTH   CYLINDER

REY NO. = 0.382 E+6	K/D = 0.0000	MACH NO. = 0.054
CD = 0.266	CL = -0.052	RUN ID = 60

THETA	CP	THETA	CP	THETA	CP
0.01	1.0034	120.01	-1.1090	240.01	-0.8957
4.96	0.9597	124.96	-0.6009	244.96	-1.2702
9.97	0.8758	129.97	-0.4739	249.97	-2.3591
14.96	0.7294	134.96	-0.3685	254.96	-2.5231
20.11	0.5311	140.11	-0.3633	260.11	-2.5598
20.01	0.5809	140.01	-0.3526	260.01	-2.5656
24.96	0.3290	144.96	-0.3697	264.96	-2.7147
29.97	0.0080	149.97	-0.3866	269.97	-2.8892
34.96	-0.2974	154.96	-0.4016	274.96	-2.9037
40.11	-0.6180	160.11	-0.3928	280.11	-2.8725
40.01		160.01	-0.3485	280.01	-2.8554
44.96		164.96	-0.3575	284.96	-2.7307
49.97		169.97	-0.4107	289.97	-2.6476
54.96		174.96	-0.3776	294.96	-2.4063
60.11		180.11	-0.3563	300.11	-2.1270
60.01	-1.9459	180.01	-0.3405	300.01	-1.9980
64.96	-2.2425	184.96	-0.3615	304.96	-1.7338
69.97	-2.4857	189.97	-0.4026	309.97	-1.4372
74.96	-2.6876	194.96	-0.3776	314.96	-1.0589
80.11	-2.7732	200.11	-0.3803	320.11	-0.7013
80.01	-2.9076	200.01	-0.3405	320.01	-0.6587
84.96	-2.9152	204.96	-0.3456	324.96	-0.3414
89.97	-2.9415	209.97	-0.3986	329.97	-0.0636
94.96	-2.7793	214.96	-0.3656	334.96	0.2578
100.11	-2.5639	220.11	-0.3643	340.11	0.5118
100.01		220.01	-0.3164	340.01	0.5331
104.96		224.96	-0.3615	344.96	0.7257
109.97		229.97	-0.4549	349.97	0.8442
114.96		234.96	-0.6017	354.96	0.9598
120.11		240.11	-0.9561	360.11	1.0113

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	60: 1	0.9955		0.9955	1.0034	1.0194	1.0234		1.0154
8.96	60: 2	0.9121		0.9240	0.9280	0.9280	0.9359		0.9479
13.97	60: 3	0.7562		0.7562	0.7562	0.7642	0.7802		0.8362
18.96	60: 4	0.5745		0.5944	0.6063	0.6142	0.6381		0.6941
24.11	60: 5	0.3406		0.3644	0.3763	0.3803	0.3961		0.5237
64.01	60: 1	-2.0420	-2.1780	-2.2021	-2.1540	-2.0900	-1.9259	-1.8615	
68.96	60: 2	-2.2983	-2.4337	-2.4217	-2.3899	-2.3182	-2.1629	-1.9927	
73.97	60: 3	-2.5097	-2.6496	-2.6775	-2.6695	-2.5816	-2.4098	-2.1646	
78.96	60: 4	-2.6279	-2.7951	-2.7991	-2.7752	-2.7473	-2.4567	-2.3060	
84.11	60: 5	-2.6777	-2.7732	-2.8648	-2.8409	-2.7692	-2.6260	-2.2833	
124.01	60: 1	-0.6986		-0.8113	-0.8193	-0.9078	-0.6262		
128.96	60: 2	-0.4698		-0.4738	-0.5379	-0.5739	-0.5579		
133.97	60: 3	-0.4107		-0.4066	-0.4549	-0.5473	-0.6276		
138.96	60: 4	-0.4096		-0.4136	-0.4016	-0.4856	-0.6617		
144.11	60: 5	-0.3728		-0.3849	-0.4168	-0.4208	-0.6729		

SMOOTH   CYLINDER

REY NO. = 0.372 E+6   K/D = 0.0000   MACH NO. = 0.053
CD = 0.521   CL = -0.438   RUN ID = 61

THETA	CP	THETA	CP	THETA	CP
0.02	0.9569	120.02	-1.8799	240.02	-0.7108
4.98	0.8175	124.98	-1.0311	244.98	-0.6991
10.00	0.9737	130.00	-0.7229	250.00	-3.1164
14.95	0.9317	134.95	-0.7468	254.95	-3.4630
20.08	0.8182	140.08	-0.7308	260.08	-3.4878
20.02	0.2213	140.02	-0.6738	260.02	-0.8098
24.98	-0.1227	144.98	-0.6787	264.98	-0.8307
30.00	0.5028	150.00	-0.7200	270.00	-3.3379
34.95	0.2810	154.95	-0.7563	274.95	-3.9539
40.08	0.0503	160.08	-0.6846	280.08	-3.7950
40.02		160.02	-0.6556	280.02	-0.9330
44.98		164.98	-0.6991	284.98	-0.9927
50.00		170.00	-0.7023	290.00	-3.5802
54.95		174.95	-0.6578	294.95	-3.3719
60.08		180.08	-0.6634	300.08	-3.0300
60.02	-2.7458	180.02	-0.6260	300.02	-0.8424
64.98	-3.1246	184.98	-0.7289	304.98	-0.6751
70.00	-0.9638	190.00	-0.6896	310.00	-2.0705
74.95	-1.0372	194.95	-0.6960	314.95	-1.8143
80.08	-0.7974	200.08	-0.6888	320.08	-1.3855
80.02	-3.8034	200.02	-0.7066	320.02	-0.0016
84.98	-3.8460	204.98	-0.6820	324.98	0.2316
90.00	-0.9568	210.00	-0.6938	330.00	-0.5862
94.95	-0.8488	214.95	-0.6917	334.95	-0.2607
100.08	-0.7478	220.08	-0.6676	340.08	0.0964
100.02		220.02	-0.6981	340.02	0.8141
104.98		224.98	-0.7076	344.98	0.9147
110.00		230.00	-0.6302	350.00	0.6289
114.95		234.95	-1.2299	354.95	0.7848
120.08		240.08	-1.4352	360.08	0.9024

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	61: 1	0.8811		0.8769	0.8769	0.8853	0.8938		0.9654
8.98	61: 2	0.6950		0.7204	0.7288	0.7499	0.7752		0.8388
14.00	61: 3	0.9317		0.9317	0.9317	0.9190	0.8938		0.9233
18.95	61: 4	0.8518		0.8308	0.8098	0.7972	0.7762		0.8227
24.08	61: 5	0.7005		0.6878	0.6668	0.6542	0.6289		0.6799
64.02	61: 1	-2.7838	-3.0245	-2.9527	-2.8134	-2.6614	-2.4249	-2.1602	
68.98	61: 2	-3.0442	-3.3109	-3.2855	-3.2136	-2.9595	-2.6335	-2.3746	
74.00	61: 3	-0.9596	-1.0356	-1.0060	-1.0187	-1.0525	-1.3817	-1.6329	
78.95	61: 4	-0.8728	-0.8560	-0.8054	-0.9319	-0.9065	-0.9908	-1.0229	
84.08	61: 5	-0.7552	-0.8268	-0.8100	-0.8732	-0.9491	-0.9028	-0.8497	
124.02	61: 1	-1.1238		-1.2639	-1.1875	-0.8648	-0.6992		
128.98	61: 2	-0.7213		-0.9853	-0.9214	-0.7468	-0.6744		
134.00	61: 3	-0.6903		-0.7115	-0.7454	-0.7412	-0.8133		
138.95	61: 4	-0.7266		-0.7266	-0.7563	-0.7605	-0.7690		
144.08	61: 5	-0.7016		-0.7270	-0.7567	-0.8075	-0.7609		

SMOOTH   CYLINDER

REY NO. = 0.371 E+6   K/D = 0.0000   MACH NO. = 0.053
CD = 0.553   CL = 0.868   RUN ID   = 63

THETA	CP	THETA	CP	THETA	CP
0.02	0.9502	120.02	-1.5787	240.02	-0.6443
4.96	0.8497	124.96	-1.1635	244.96	-0.6502
10.00	0.6816	130.00	-0.8419	250.00	-0.6624
14.99	0.5131	134.99	-0.6367	254.99	-0.6907
20.09	0.8086	140.09	-0.6633	260.09	-3.4365
20.02	0.2242	140.02	-0.6244	260.02	-0.7289
24.96	-0.0522	144.96	-0.6136	264.96	-0.7316
30.00	-0.4236	150.00	-0.6723	270.00	-0.8546
34.99	-0.7651	154.99	-0.6030	274.99	-0.8238
40.09	0.0566	160.09	-0.7061	280.09	-3.8481
40.02		160.02	-0.6106	280.02	-0.8388
44.96		164.96	-0.6164	284.96	-0.9645
50.00		170.00	-0.6412	290.00	-1.0116
54.99		174.99	-0.6440	294.99	-0.9385
60.09		180.09	-0.6963	300.09	-2.9561
60.02	-2.7025	180.02	-0.6359	300.02	-0.7940
64.96	-3.0252	184.96	-0.6629	304.96	-0.5994
70.00	-3.3757	190.00	-0.6328	310.00	-0.4068
74.99	-3.4674	194.99	-0.6694	314.99	-0.2199
80.09	-0.8789	200.09	-0.6620	320.09	-1.3375
80.02	-3.6800	200.02	-0.6443	320.02	0.0114
84.96	-3.6281	204.96	-0.6291	324.96	0.2485
90.00	-3.7793	210.00	-0.6582	330.00	0.4978
94.99	-3.5111	214.99	-0.6991	334.99	0.6691
100.09	-0.8013	220.09	-0.6534	340.09	0.1629
100.02		220.02	-0.6907	340.02	0.8335
104.96		224.96	-0.6249	344.96	0.9586
110.00		230.00	-0.6328	350.00	1.0339
114.99		234.99	-0.6694	354.99	1.0213
120.09		240.09	-1.6498	360.09	0.9789

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	63: 1	0.8791		0.9000	0.9126	0.9126	0.9168		0.9587
8.96	63: 2	0.7367		0.7660	0.7744	0.7744	0.7995		0.9002
14.00	63: 3	0.5305		0.5641	0.5851	0.6144	0.6522		0.7700
18.99	63: 4	0.5089		0.2947	0.3031	0.3493	0.3871		0.6607
24.09	63: 5	0.7065		0.7235	0.7363	0.7277	0.7235		0.6899
64.02	63: 1	-2.7654	-2.9332	-2.9583	-2.7906	-2.6732	-2.3880	-2.1284	
68.96	63: 2	-2.9580	-3.1763	-3.2183	-3.0840	-2.9076	-2.4795	-2.2391	
74.00	63: 3	-3.2452	-3.4935	-3.4514	-3.3336	-3.0811	-2.7445	-2.4380	
78.99	63: 4	-3.1049	-3.5517	-3.6444	-3.5095	-3.2903	-2.7972	-2.4438	
84.09	63: 5	-0.8063	-0.8490	-0.8874	-0.8447	-0.8234	-0.7850	-0.8874	
124.02	63: 1	-1.1350		-1.3461	-1.2870	-0.9156	-0.7299		
128.96	63: 2	-0.6643		-0.9262	-0.9516	-0.7783	-0.6431		
134.00	63: 3	-0.6596		-0.7570	-0.7866	-0.6977	-0.6681		
138.99	63: 4	-0.7897		-0.6751	-0.6497	-0.7557	-0.5624		
144.09	63: 5	-0.7362		-0.7276	-0.7190	-0.7061	-0.5674		

REY NO. = 0.383 E+6	K/D = 0.0000	MACH NO. = 0.054
CD = 0.263	CL = -0.078	RUN ID = 64

THETA	CP	THETA	CP	THETA	CP
0.02	1.0270	120.02	-0.9568	240.02	-0.9226
4.97	0.9951	124.97	-0.7315	244.97	-1.3424
9.97	0.9197	129.97	-0.4231	249.97	-2.4772
15.00	0.7886	135.00	-0.3395	255.00	-2.4992
20.12	0.5429	140.12	-0.3458	260.12	-2.5027
20.02	0.5942	140.02	-0.3502	260.02	-2.5626
24.97	0.3377	144.97	-0.3435	264.97	-2.6829
29.97	0.0798	149.97	-0.3320	269.97	-2.8176
35.00	-0.2373	155.00	-0.3322	275.00	-2.8680
40.12	-0.6089	160.12	-0.3672	280.12	-2.8349
40.02		160.02	-0.3328	280.02	-2.8403
44.97		164.97	-0.3698	284.97	-2.7512
49.97		169.97	-0.3425	289.97	-2.6207
55.00		175.00	-0.3032	295.00	-2.3575
60.12		180.12	-0.3576	300.12	-2.0641
60.02	-1.9253	180.02	-0.3168	300.02	-2.0255
64.97	-2.2006	184.97	-0.3417	304.97	-1.7456
69.97	-2.4419	189.97	-0.3425	309.97	-1.3941
75.00	-2.6460	195.00	-0.3153	315.00	-1.0378
80.12	-2.7817	200.12	-0.3616	320.12	-0.6802
80.02	-2.8041	200.02	-0.3328	320.02	-0.6799
84.97	-2.9037	204.97	-0.3618	324.97	-0.3633
89.97	-2.8417	209.97	-0.3345	329.97	-0.0390
95.00	-2.6590	215.00	-0.3313	335.00	0.2739
100.12	-2.5981	220.12	-0.3576	340.12	0.5318
100.02		220.02	-0.3328	340.02	0.5347
104.97		224.97	-0.3698	344.97	0.7219
109.97		229.97	-0.4186	349.97	0.8882
115.00		235.00	-0.5597	355.00	0.9991
120.12		240.12	-0.9819	360.12	1.0269

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	64: 1	1.0111		1.0031	1.0031	1.0031	0.9991		1.0269
8.97	64: 2	0.9277		0.9277	0.9277	0.9198	0.9316		0.9634
13.97	64: 3	0.8085		0.8165	0.8046	0.8006	0.8006		0.8882
19.00	64: 4	0.6456		0.6377	0.6297	0.6297	0.6456		0.7574
24.12	64: 5	0.3565		0.3724	0.3843	0.3961	0.4239		0.5318
64.02	64: 1	-2.0291	-2.1567	-2.1807	-2.1567	-2.1009	-1.9333	-1.7859	
68.97	64: 2	-2.2802	-2.4315	-2.4394	-2.3917	-2.3121	-2.1807	-1.9682	
73.97	64: 3	-2.4538	-2.5932	-2.5892	-2.6091	-2.5454	-2.3384	-2.0744	
79.00	64: 4	-2.5544	-2.7576	-2.7177	-2.7735	-2.7257	-2.5066	-2.2208	
84.12	64: 5	-2.6543	-2.8215	-2.8533	-2.8573	-2.7976	-2.5947	-2.2769	
124.02	64: 1	-0.6876		-0.7719	-0.8683	-0.8924	-0.6153		
128.97	64: 2	-0.4477		-0.5038	-0.4918	-0.5719	-0.5679		
133.97	64: 3	-0.3481		-0.3641	-0.4523	-0.4924	-0.6288		
139.00	64: 4	-0.3202		-0.3442	-0.3844	-0.4084	-0.6049		
144.12	64: 5	-0.3471		-0.3551	-0.3791	-0.4473	-0.5795		

SMOOTH CYLINDER

REY NO. = 0.393 E+6   K/D = 0.0000   MACH NO. = 0.055
CD = 0.254   CL = -0.073   RUN ID = 65

THETA	CP	THETA	CP	THETA	CP
0.00	1.0373	120.00	-1.0481	240.00	-0.9271
4.95	0.9995	124.95	-0.6919	244.95	-1.3072
10.00	0.8942	130.00	-0.3942	250.00	-2.4277
14.95	0.7819	134.95	-0.3404	254.95	-2.4101
20.11	0.5784	140.11	-0.3439	260.11	-2.5707
20.00	0.5927	140.00	-0.3001	260.00	-2.5456
24.95	0.3594	144.95	-0.3148	264.95	-2.6543
30.00	0.0529	150.00	-0.3266	270.00	-2.8389
34.95	-0.2359	154.95	-0.3151	274.95	-2.8190
40.11	-0.5914	160.11	-0.3069	280.11	-2.8138
40.00		160.00	-0.3255	280.00	-2.8283
44.95		164.95	-0.3137	284.95	-2.7535
50.00		170.00	-0.3478	290.00	-2.5495
54.95		174.95	-0.3022	294.95	-2.3028
60.11		180.11	-0.2981	300.11	-2.1059
60.00	-1.9004	180.00	-0.3179	300.00	-2.0140
64.95	-2.2023	184.95	-0.3023	304.95	-1.7190
70.00	-2.4279	190.00	-0.3175	310.00	-1.3783
74.95	-2.6054	194.95	-0.3136	314.95	-1.0220
80.11	-2.7053	200.11	-0.3512	320.11	-0.7002
80.00	-2.8092	200.00	-0.3522	320.00	-0.6768
84.95	-2.8452	204.95	-0.3251	324.95	-0.3447
90.00	-2.8427	210.00	-0.3250	330.00	-0.0147
94.95	-2.6747	214.95	-0.2947	334.95	0.2882
100.11	-2.5169	220.11	-0.3322	340.11	0.4892
100.00		220.00	-0.3559	340.00	0.5286
104.95		224.95	-0.3251	344.95	0.7397
110.00		230.00	-0.4693	350.00	0.8906
114.95		234.95	-0.5444	354.95	1.0070
120.11		240.11	-0.9848	360.11	1.0033

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	65: 1	1.0109		0.9995	0.9920	0.9958	0.9920		1.0297
8.95	65: 2	0.9392		0.9392	0.9429	0.9429	0.9429		0.9807
14.00	65: 3	0.7888		0.7925	0.8039	0.8076	0.8189		0.8568
18.95	65: ·	0.6393		0.6318	0.6468	0.6468	0.6656		0.7450
24.11	65: 5	0.3754		0.3641	0.3604	0.3604	0.3829		0.5605
64.00	65: 1	-2.0102	-2.1578	-2.1843	-2.1692	-2.1162	-2.0253	-1.8121	
68.95	65: 2	-2.2667	-2.4105	-2.3953	-2.4067	-2.3802	-2.1910	-1.9670	
74.00	65: 3	-2.4430	-2.6015	-2.6166	-2.6053	-2.5374	-2.4090	-2.1687	
78.95	65: 4	-2.5678	-2.7221	-2.7559	-2.7221	-2.6694	-2.5151	-2.2648	
84.11	65: 5	-2.6072	-2.7883	-2.8298	-2.8185	-2.8110	-2.6110	-2.2163	
124.00	65: 1	-0.6775		-0.8299	-0.8909	-0.9404	-0.7461		
128.95	65: 2	-0.4825		-0.4634	-0.4215	-0.6158	-0.5701		
134.00	65: 3	-0.3532		-0.3722	-0.3950	-0.4330	-0.5621		
138.95	65: 4	-0.3189		-0.3454	-0.3417	-0.3682	-0.5462		
144.11	65: 5	-0.3069		-0.3601	-0.3601	-0.4475	-0.6374		

SMOOTH   CYLINDER

REY NO. = 0.403 E+6   K/D = 0.0000   MACH NO. = 0.057
CD = 0.249   CL = -0.061   RUN ID = 66

THETA	CP	THETA	CP	THETA	CP
0.02	0.9713	120.02	-1.1273	240.02	-0.9284
4.97	0.9714	124.97	-0.6724	244.97	-1.3655
9.98	0.9104	129.98	-0.4359	249.98	-2.3617
14.94	0.7572	134.94	-0.3188	254.94	-2.4614
20.09	0.5992	140.09	-0.2826	260.09	-2.4551
20.02	0.5534	140.02	-0.3741	260.02	-2.5043
24.97	0.3413	144.97	-0.3156	264.97	-2.5579
29.98	0.0635	149.98	-0.3101	269.98	-2.8652
34.94	-0.2319	154.94	-0.3373	274.94	-2.8189
40.09	-0.5529	160.09	-0.2689	280.09	-2.7282
40.02		160.02	-0.3434	280.02	-2.8196
44.97		164.97	-0.3142	284.97	-2.7132
49.98		169.98	-0.3086	289.98	-2.5751
54.94		174.94	-0.3219	294.94	-2.3059
60.09		180.09	-0.2781	300.09	-2.0217
60.02	-1.9732	180.02	-0.3253	300.02	-1.9899
64.97	-2.1715	184.97	-0.3178	304.97	-1.6845
69.98	-2.4201	189.98	-0.3303	309.98	-1.4091
74.94	-2.5971	194.94	-0.3183	314.94	-1.0153
80.09	-2.6758	200.09	-0.2961	320.09	-0.6493
80.02	-2.8232	200.02	-0.3253	320.02	-0.6718
84.97	-2.8288	204.97	-0.3322	324.97	-0.3530
89.98	-2.8000	209.98	-0.3375	329.98	-0.0545
94.94	-2.6455	214.94	-0.3003	334.94	0.2701
100.09	-2.4637	220.09	-0.2889	340.09	0.5430
100.02		220.02	-0.3326	340.02	0.5141
104.97		224.97	-0.3502	344.97	0.7115
109.98		229.98	-0.4207	349.98	0.8569
114.94		234.94	-0.5524	354.94	0.9715
120.09		240.09	-0.8666	360.09	1.0356

THETA	RUN:SEQ	X/D= 0.5	1.0	CP VS. X/D 1.5	2.0	2.5	3.0	3.5	4.0
4.02	66: 1	0.9570		0.9605	0.9677	0.9641	0.9713		0.9714
8.97	66: 2	0.9107		0.9036	0.9000	0.9000	0.8929		0.9536
13.98	66: 3	0.7993		0.7886	0.7778	0.7671	0.7778		0.8677
18.94	66: 4	0.6074		0.6145	0.6216	0.6252	0.6395		0.7258
24.09	66: 5	0.4025		0.3989	0.4025	0.4060	0.4204		0.5787
64.02	66: 1	-2.0522	-2.1599	-2.1886	-2.1348	-2.1276	-2.0198	-1.8556	
68.97	66: 2	-2.2251	-2.3683	-2.3719	-2.3719	-2.3433	-2.2288	-1.9691	
73.98	66: 3	-2.4381	-2.5746	-2.5926	-2.6034	-2.5854	-2.4238	-2.1546	
78.94	66: 4	-2.5362	-2.6830	-2.6937	-2.7331	-2.6901	-2.5649	-2.2806	
84.09	66: 5	-2.5825	-2.7584	-2.7691	-2.7332	-2.7476	-2.6327	-2.2862	
124.02	66: 1	-0.7863		-0.8731	-0.8116	-1.0394	-0.7791		
128.97	66: 2	-0.4273		-0.4669	-0.4850	-0.6147	-0.6471		
133.98	66: 3	-0.3391		-0.3680	-0.4042	-0.4187	-0.6105		
138.94	66: 4	-0.3084		-0.3301	-0.3589	-0.3913	-0.5896		
144.09	66: 5	-0.2798		-0.2979	-0.3087	-0.3630	-0.5148		

SMOOTH CYLINDER

REY NO. = 0.406 E+6	K/D = 0.0000	MACH NO. = 0.057	
CD = 0.242	CL = -0.054	RUN ID = 67	

THETA	CP	THETA	CP	THETA	CP
0.02	1.0035	120.02	-1.0570	240.02	-0.9712
4.98	0.9859	124.98	-0.7015	244.98	-1.3245
9.99	0.9192	129.99	-0.3917	249.99	-2.0461
14.97	0.7612	134.97	-0.3091	254.97	-2.4321
20.10	0.5878	140.10	-0.3025	260.10	-2.5267
20.02	0.5820	140.02	-0.3161	260.02	-2.5008
24.98	0.3431	144.98	-0.3024	264.98	-2.6170
29.99	0.0780	149.99	-0.3030	269.99	-2.7374
34.97	-0.2401	154.97	-0.3095	274.97	-2.7992
40.10	-0.5639	160.10	-0.3027	280.10	-2.8076
40.02		160.02	-0.3284	280.02	-2.7967
44.98		164.98	-0.2937	284.98	-2.7347
49.99		169.99	-0.3085	289.99	-2.5203
54.97		174.97	-0.2870	294.97	-2.3047
60.10		180.10	-0.2941	300.10	-2.0511
60.02	-1.8962	180.02	-0.3071	300.02	-1.9823
64.98	-2.1546	184.98	-0.3115	304.98	-1.7119
69.99	-2.3945	189.99	-0.2979	309.99	-1.3558
74.97	-2.5626	194.97	-0.3154	314.97	-1.0142
80.10	-2.7324	200.10	-0.2941	320.10	-0.6658
80.02	-2.7717	200.02	-0.3213	320.02	-0.6756
84.98	-2.8310	204.98	-0.3293	324.98	-0.3630
89.99	-2.7730	209.99	-0.3156	329.99	-0.0166
94.97	-2.6498	214.97	-0.2835	334.97	0.2819
100.10	-2.5114	220.10	-0.3047	340.10	0.5361
100.02		220.02	-0.3319	340.02	0.5223
104.98		224.98	-0.3364	344.98	0.6979
109.99		229.99	-0.3617	349.99	0.8843
114.97		234.97	-0.5175	354.97	0.9790
120.10		240.10	-0.9554	360.10	1.0352

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
.02	67: 1	0.9930		0.9894	0.9824	0.9789	0.9718		1.0070
9.98	67: 2	0.9225		0.9085	0.9015	0.9015	0.9015		0.9613
13.99	67: 3	0.8102		0.8032	0.8032	0.7997	0.8102		0.8703
18.97	67: 4	0.6136		0.6277	0.6382	0.6418	0.6487		0.7233
24.10	67: 5	0.3906		0.3906	0.3941	0.3941	0.4187		0.5712
64.02	67: 1	-2.0056	-2.1116	-2.1469	-2.1434	-2.1010	-1.9950	-1.8056	
68.98	67: 2	-2.2500	-2.3842	-2.3842	-2.4160	-2.3772	-2.2323	-1.9963	
73.99	67: 3	-2.3804	-2.5602	-2.5285	-2.5531	-2.5320	-2.3769	-2.1572	
78.97	67: 4	-2.5309	-2.7001	-2.7318	-2.6684	-2.6754	-2.5415	-2.2656	
84.10	67: 5	-2.6157	-2.7818	-2.7924	-2.7853	-2.8066	-2.6298	-2.3081	
124.02	67: 1	-0.6505		-0.7821	-0.8817	-0.8710	-0.7643		
128.98	67: 2	-0.4448		-0.4483	-0.4554	-0.6369	-0.6511		
133.99	67: 3	-0.3101		-0.3207	-0.3562	-0.4343	-0.5480		
138.97	67: 4	-0.3095		-0.3450	-0.3166	-0.3876	-0.5579		
144.10	67: 5	-0.2957		-0.3098	-0.3454	-0.3597	-0.5448		

SMOOTH CYLINDER

REY NO. = 0.425 E+6   K/D = 0.0000   MACH NO. = 0.060
CD = 0.236   CL = -0.068   RUN ID = 68

THETA	CP	THETA	CP	THETA	CP
0.00	0.9942	120.00	-1.0634	240.00	-0.9946
4.99	0.9878	124.99	-0.6489	244.99	-1.3752
9.99	0.9302	129.99	-0.4101	249.99	-2.1825
14.99	0.7695	134.99	-0.3203	254.99	-2.4257
20.11	0.5809	140.11	-0.2882	260.11	-2.4585
20.00	0.5647	140.00	-0.3117	260.00	-2.5350
24.99	0.3468	144.99	-0.2976	264.99	-2.6401
29.99	0.0810	149.99	-0.2710	269.99	-2.7677
34.99	-0.2451	154.99	-0.3105	274.99	-2.8320
40.11	-0.5805	160.11	-0.2913	280.11	-2.7619
40.00		160.00	-0.3101	280.00	-2.8150
44.99		164.99	-0.2991	284.99	-2.7345
49.99		169.99	-0.2597	289.99	-2.5310
54.99		174.99	-0.2895	294.99	-2.3114
60.11		180.11	-0.2602	300.11	-2.0022
60.00	-1.9178	180.00	-0.3101	300.00	-2.0062
64.99	-2.1823	184.99	-0.3023	304.99	-1.7013
69.99	-2.3849	189.99	-0.2888	309.99	-1.3623
74.99	-2.5943	194.99	-0.3284	314.99	-1.0168
80.11	-2.6752	200.11	-0.2796	320.11	-0.6571
80.00	-2.8117	200.00	-0.3230	320.00	-0.6919
84.99	-2.8679	204.99	-0.3088	324.99	-0.3455
89.99	-2.6964	209.99	-0.3082	329.99	-0.0212
94.99	-2.6595	214.99	-0.2992	334.99	0.2705
100.11	-2.4762	220.11	-0.2925	340.11	0.5311
100.00		220.00	-0.3101	340.00	0.5070
104.99		224.99	-0.3121	344.99	0.7282
109.99		229.99	-0.3567	349.99	0.8825
114.99		234.99	-0.5845	354.99	0.9782
120.11		240.11	-0.9779	360.11	1.0134

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	68: 1	0.9813		0.9813	0.9813	0.9813	0.9781		0.9878
8.99	68: 2	0.9300		0.9236	0.9236	0.9203	0.9203		0.9622
13.99	68: 3	0.8181		0.8086	0.8022	0.8022	0.8054		0.8825
18.99	68: 4	0.6154		0.6154	0.6154	0.6218	0.6347		0.7285
24.11	68: 5	0.3823		0.4015	0.3983	0.3983	0.4143		0.5566
64.00	68: 1	-2.0307	-2.1468	-2.1629	-2.1436	-2.1597	-2.0597	-1.8644	
68.99	68: 2	-2.2500	-2.3950	-2.3885	-2.4143	-2.3563	-2.2725	-2.0382	
73.99	68: 3	-2.3816	-2.5262	-2.5583	-2.5647	-2.5551	-2.4620	-2.1742	
78.99	68: 4	-2.5525	-2.6878	-2.7103	-2.6845	-2.6523	-2.6040	-2.3309	
84.11	68: 5	-2.6045	-2.7394	-2.6880	-2.7555	-2.7876	-2.6752	-2.3561	
124.00	68: 1	-0.7859		-0.7372	-0.6202	-1.0847	-0.9646		
128.99	68: 2	-0.4145		-0.4080	-0.4729	-0.5540	-0.6839		
133.99	68: 3	-0.2936		-0.3227	-0.3421	-0.3907	-0.5298		
138.99	68: 4	-0.2976		-0.3041	-0.3105	-0.3430	-0.4793		
144.11	68: 5	-0.2880		-0.2880	-0.2913	-0.3204	-0.4370		

SMOOTH   CYLINDER

THETA	CP	THETA	CP	THETA	CP
0.01	1.0195	120.01	-0.9703	240.01	-1.0123
4.98	1.0071	124.98	-0.6289	244.98	-1.3283
9.98	0.9263	129.98	-0.3783	249.98	-2.2233
14.98	0.7989	134.98	-0.2946	254.98	-2.4532
20.11	0.5794	140.11	-0.2886	260.11	-2.5255
20.01	0.5999	140.01	-0.2627	260.01	-2.5086
24.98	0.3590	144.98	-0.2659	264.98	-2.6400
29.98	0.0809	149.98	-0.2839	269.98	-2.7775
34.98	-0.2263	154.98	-0.2691	274.98	-2.8319
40.11	-0.5834	160.11	-0.2822	280.11	-2.7989
40.01		160.01	-0.2763	280.01	-2.7708
44.98		164.98	-0.2705	284.98	-2.6747
49.98		169.98	-0.2851	289.98	-2.5225
54.98		174.98	-0.2614	294.98	-2.3118
60.11		180.11	-0.2766	300.11	-2.0671
60.01	-1.8820	180.01	-0.2448	300.01	-1.9674
64.98	-2.1344	184.98	-0.2767	304.98	-1.6811
69.98	-2.3965	189.98	-0.2819	309.98	-1.3626
74.98	-2.5459	194.98	-0.2771	314.98	-1.0197
80.11	-2.7086	200.11	-0.2830	320.11	-0.6647
80.01	-2.7423	200.01	-0.2637	320.01	-0.6340
84.98	-2.7913	204.98	-0.2956	324.98	-0.3262
89.98	-2.7996	209.98	-0.2882	329.98	-0.0183
94.98	-2.6617	214.98	-0.2677	334.98	0.2788
100.11	-2.5157	220.11	-0.2861	340.11	0.5305
100.01		220.01	-0.2731	340.01	0.5533
104.98		224.98	-0.3050	344.98	0.7435
109.98		229.98	-0.3603	349.98	0.8862
114.98		234.98	-0.5785	354.98	0.9915
120.11		240.11	-0.9640	360.11	1.0374

CP   VS.   X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	69: 1	1.0071		1.0102	1.0133	1.0195	1.0133		1.0226
8.98	69: 2	0.9418		0.9387	0.9356	0.9356	0.9294		0.9760
13.98	69: 3	0.8145		0.8083	0.8083	0.8083	0.8114		0.8831
18.98	69: 4	0.6405		0.6343	0.6343	0.6343	0.6467		0.7529
24.11	69: 5	0.3973		0.4036	0.4036	0.4067	0.4130		0.5681
64.01	69: 1	-1.9852	-2.1103	-2.1134	-2.1103	-2.0852	-2.0164	-1.7852	
68.98	69: 2	-2.2218	-2.3434	-2.3621	-2.3372	-2.3434	-2.2498	-1.9654	
73.98	69: 3	-2.4090	-2.5399	-2.5586	-2.5555	-2.5555	-2.4464	-2.1666	
78.98	69: 4	-2.5178	-2.6894	-2.7143	-2.7299	-2.7081	-2.6114	-2.3055	
84.11	69: 5	-2.6362	-2.7779	-2.8030	-2.8345	-2.8219	-2.7558	-2.3852	
124.01	69: 1	-0.6912		-0.6660	-0.7007	-0.9213	-0.9780		
128.98	69: 2	-0.4011		-0.3980	-0.4326	-0.5300	-0.6180		
133.98	69: 3	-0.3154		-0.3216	-0.3342	-0.3813	-0.4975		
138.98	69: 4	-0.2628		-0.3005	-0.3131	-0.3257	-0.4389		
144.11	69: 5	-0.2822		-0.2949	-0.3076	-0.3298	-0.4790		

REY NO. = 0.447 E+6   K/D = 0.0000   MACH NO. = 0.063
CD = 0.223   CL = -0.046   RUN ID = 70

THETA	CP	THETA	CP	THETA	CP
0.02	1.0063	120.02	-1.0445	240.02	-0.9773
4.96	1.0063	124.96	-0.6543	244.96	-1.3193
10.01	0.9070	130.01	-0.3387	250.01	-2.0846
14.99	0.7836	134.99	-0.2836	254.99	-2.4578
20.11	0.5834	140.11	-0.2777	260.11	-2.4786
20.02	0.5896	140.02	-0.3004	260.02	-2.4611
24.96	0.3723	144.96	-0.2743	264.96	-2.6149
30.01	0.0744	150.01	-0.2854	270.01	-2.7324
34.99	-0.2209	154.99	-0.2775	274.99	-2.8218
40.11	-0.5815	160.11	-0.2776	280.11	-2.7749
40.02		160.02	-0.2541	280.02	-2.7693
44.96		164.96	-0.2601	284.96	-2.6892
50.01		170.01	-0.2737	290.01	-2.5043
54.99		174.99	-0.2776	294.99	-2.3165
60.11		180.11	-0.2575	300.11	-2.0115
60.02	-1.8961	180.02	-0.2541	300.02	-1.9453
64.96	-2.1881	184.96	-0.2690	304.96	-1.6698
70.01	-2.4229	190.01	-0.2825	310.01	-1.3350
74.99	-2.5844	194.99	-0.2746	314.99	-1.0038
80.11	-2.6975	200.11	-0.2692	320.11	-0.6542
80.02	-2.7337	200.02	-0.2541	320.02	-0.6312
84.96	-2.8407	204.96	-0.2690	324.96	-0.2996
90.01	-2.7621	210.01	-0.2737	330.01	-0.0013
94.99	-2.6316	214.99	-0.2628	334.99	0.2904
100.11	-2.5086	220.11	-0.2722	340.11	0.5410
100.02		220.02	-0.2689	340.02	0.5546
104.96		224.96	-0.2630	344.96	0.7667
110.01		230.01	-0.3710	350.01	0.8985
114.99		234.99	-0.5527	354.99	1.0092
120.11		240.11	-0.9556	360.11	1.0208

				CP	VS.	X/D			
THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	70: 1	0.9916		1.0121	1.0150	1.0180	1.0209		1.0033
8.96	70: 2	0.9477		0.9652	0.9652	0.9711	0.9711		0.9799
14.01	70: 3	0.7989		0.8106	0.8106	0.8135	0.8252		0.8664
18.99	70: 4	0.6370		0.6487	0.6487	0.6429	0.6605		0.7521
24.11	70: 5	0.4026		0.3968	0.4026	0.4026	0.4376		0.5642
64.02	70: 1	-1.9987	-2.1218	-2.1101	-2.1072	-2.0720	-1.9928	-1.8268	
68.96	70: 2	-2.2293	-2.3764	-2.3587	-2.3705	-2.3323	-2.2440	-2.0862	
74.01	70: 3	-2.4259	-2.5402	-2.5724	-2.5665	-2.5284	-2.4727	-2.1992	
78.99	70: 4	-2.5432	-2.6962	-2.6550	-2.7079	-2.7197	-2.6403	-2.3254	
84.11	70: 5	-2.5394	-2.7297	-2.7180	-2.7707	-2.7970	-2.6916	-2.3755	
124.02	70: 1	-0.7350		-0.6641	-0.7676	-0.7735	-1.0396		
128.96	70: 2	-0.3692		-0.3781	-0.4137	-0.4285	-0.6153		
134.01	70: 3	-0.3179		-0.2943	-0.3209	-0.3357	-0.4923		
138.99	70: 4	-0.2834		-0.2478	-0.3012	-0.3338	-0.3991		
144.11	70: 5	-0.2717		-0.2658	-0.2924	-0.3278	-0.3839		

SMOOTH   CYLINDER

REY NO. = 0.478 E+6   K/D = 0.0000   MACH NO. = 0.067
CD = 0.222   CL = -0.074   RUN ID = 71

THETA	CP	THETA	CP	THETA	CP
0.00	1.0282	120.00	-0.9961	240.00	-0.9226
4.99	0.9952	124.99	-0.6034	244.99	-1.3572
10.00	0.9213	130.00	-0.3616	250.00	-2.2256
14.94	0.7595	134.94	-0.2966	254.94	-2.3873
20.09	0.5705	140.09	-0.2671	260.09	-2.4498
20.00	0.5998	140.00	-0.2577	260.00	-2.4792
24.99	0.3662	144.99	-0.2689	264.99	-2.6370
30.00	0.0710	150.00	-0.2679	270.00	-2.8115
34.94	-0.2382	154.94	-0.2902	274.94	-2.7925
40.09	-0.5617	160.09	-0.2737	280.09	-2.7141
40.00		160.00	-0.2474	280.00	-2.7810
44.99		164.99	-0.2507	284.99	-2.7122
50.00		170.00	-0.2757	290.00	-2.5143
54.94		174.94	-0.2621	294.94	-2.2599
60.09		180.09	-0.2482	300.09	-1.9965
60.00	-1.8458	180.00	-0.2448	300.00	-1.9654
64.99	-2.1600	184.99	-0.2481	304.99	-1.6864
70.00	-2.3830	190.00	-0.2628	310.00	-1.3583
74.94	-2.5877	194.94	-0.3056	314.94	-1.0040
80.09	-2.6901	200.09	-0.2739	320.09	-0.6454
80.00	-2.6675	200.00	-0.2628	320.00	-0.6473
84.99	-2.7718	204.99	-0.2688	324.99	-0.3291
90.00	-2.8012	210.00	-0.2628	330.00	0.0050
94.94	-2.6279	214.94	-0.2749	334.94	0.2799
100.09	-2.4689	220.09	-0.2585	340.09	0.5439
100.00		220.00	-0.2705	340.00	0.5415
104.99		224.99	-0.2739	344.99	0.7405
110.00		230.00	-0.3940	350.00	0.8962
114.94		234.94	-0.5719	354.94	0.9775
120.09		240.09	-0.8339	360.09	1.0358

THETA	RUN:SEQ	X/D= 0.5	1.0	CP VS. X/D 1.5	2.0	2.5	3.0	3.5	4.0
4.00	71: 1	1.0155		0.9977	0.9977	0.9926	0.9850		1.0256
8.99	71: 2	0.9390		0.9390	0.9364	0.9313	0.9288		0.9748
14.00	71: 3	0.8169		0.8118	0.8195	0.8169	0.8245		0.8758
19.94	71: 4	0.6124		0.6124	0.6251	0.6276	0.6429		0.7248
24.09	71: 5	0.3849		0.4052	0.4052	0.4153	0.4281		0.5565
64.00	71: 1	-1.9886	-2.0983	-2.1110	-2.1034	-2.1110	-2.0652	-1.8086	
68.99	71: 2	-2.2087	-2.3214	-2.3932	-2.3804	-2.3676	-2.2958	-2.0516	
74.00	71: 3	-2.4188	-2.5568	-2.5695	-2.5491	-2.5568	-2.4929	-2.2249	
78.94	71: 4	-2.5521	-2.6615	-2.7124	-2.7124	-2.6946	-2.6208	-2.3680	
84.09	71: 5	-2.5830	-2.7386	-2.7386	-2.7769	-2.8050	-2.7335	-2.4301	
124.00	71: 1	-0.7851		-0.5819	-0.6128	-0.8726	-1.1736		
128.99	71: 2	-0.3774		-0.4214	-0.4291	-0.5170	-0.6488		
134.00	71: 3	-0.3143		-0.2834	-0.3117	-0.3375	-0.4663		
138.94	71: 4	-0.2799		-0.2774	-0.2979	-0.3236	-0.3723		
144.09	71: 5	-0.2711		-0.2634	-0.2865	-0.3097	-0.3792		

SMOOTH   CYLINDER

THETA	CP	THETA	CP	THETA	CP
0.00	1.0250	120.00	-0.7711	240.00	-0.4792
4.98	0.9791	124.98	-0.5299	244.98	-1.3010
10.01	0.9131	130.01	-0.2661	250.01	-1.7078
14.94	0.7626	134.94	-0.2618	254.94	-2.2074
20.09	0.5896	140.09	-0.2491	260.09	-2.4364
20.00	0.6139	140.00	-0.2354	260.00	-2.4274
24.98	0.3556	144.98	-0.2755	264.98	-2.5118
30.01	0.0834	150.01	-0.2448	270.01	-2.5652
34.94	-0.2210	154.94	-0.2787	274.94	-2.6612
40.09	-0.5752	160.09	-0.2394	280.09	-2.6922
40.00		160.00	-0.2183	280.00	-2.6692
44.98		164.98	-0.2607	284.98	-2.6251
50.01		170.01	-0.2455	290.01	-2.4355
54.94		174.94	-0.2431	294.94	-2.1610
60.09		180.09	-0.2348	300.09	-1.9980
60.00	-1.8428	180.00	-0.1839	300.00	-1.9161
64.98	-2.1264	184.98	-0.2607	304.98	-1.6243
70.01	-2.3427	190.01	-0.2132	310.01	-1.2840
74.94	-2.5556	194.94	-0.2431	314.94	-0.9677
80.09	-2.6613	200.09	-0.3025	320.09	-0.6338
80.00	-2.6245	200.00	-0.2042	320.00	-0.6132
84.98	-2.7201	204.98	-0.2607	324.98	-0.3057
90.01	-2.7153	210.01	-0.2294	330.01	0.0257
94.94	-2.6043	214.94	-0.2371	334.94	0.3061
100.09	-2.4759	220.09	-0.2328	340.09	0.5506
100.00		220.00	-0.2305	340.00	0.5620
104.98		224.98	-0.2366	344.98	0.7428
110.01		230.01	-0.2193	350.01	0.8955
114.94		234.94	-0.3139	354.94	0.9949
120.09		240.09	-0.6817	360.09	1.0296

CP   VS.   X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	72: 1	1.0130		1.0210	1.0250	1.0210	1.0170		1.0269
8.98	72: 2	0.9173		0.9333	0.9373	0.9333	0.9393		0.9573
14.01	72: 3	0.8014		0.8093	0.8153	0.8213	0.8373		0.8776
18.94	72: 4	0.6244		0.6304	0.6404	0.6505	0.6625		0.7474
24.09	72: 5	0.3969		0.4050	0.4050	0.4111	0.4334		0.5607
64.00	72: 1	-1.9413	-2.0659	-2.0780	-2.0759	-2.0398	-1.9975	-1.8238	
68.98	72: 2	-2.2044	-2.3344	-2.3244	-2.3004	-2.3104	-2.2324	-2.0406	
74.01	72: 3	-2.3788	-2.5171	-2.5211	-2.4930	-2.4709	-2.4309	-2.1942	
78.94	72: 4	-2.5073	-2.6199	-2.6742	-2.6260	-2.6059	-2.5998	-2.3338	
84.09	72: 5	-2.5799	-2.7143	-2.7163	-2.7692	-2.7652	-2.7265	-2.4368	
124.00	72: 1	-0.6002		-0.6184	-0.5718	-0.7603	-1.0704		
128.98	72: 2	-0.4732		-0.3179	-0.2917	-0.4187	-0.7292		
134.01	72: 3	-0.2872		-0.2488	-0.2306	-0.2771	-0.4227		
138.94	72: 4	-0.2807		-0.2625	-0.2463	-0.2584	-0.3517		
144.09	72: 5	-0.2661		-0.2476	-0.2661	-0.2866	-0.3174		

SMOOTH CYLINDER

REY NO. = 0.395 E+6	K/D = 0.0000	MACH NO. = 0.055
CD = 0.246	CL = -0.062	RUN ID = 73

THETA	CP	THETA	CP	THETA	CP
0.01	1.0152	120.01	-1.0652	240.01	-0.9409
4.97	1.0002	124.97	-0.6465	244.97	-1.3164
9.96	0.8953	129.96	-0.3810	249.96	-2.4292
14.96	0.7835	134.96	-0.2782	254.96	-2.3623
20.08	0.5774	140.08	-0.2994	260.08	-2.4803
20.01	0.5888	140.01	-0.3109	260.01	-2.4828
24.97	0.3635	144.97	-0.2939	264.97	-2.6006
29.96	0.0928	149.96	-0.3169	269.96	-2.7170
34.96	-0.2132	154.96	-0.3087	274.96	-2.7439
40.08	-0.5772	160.08	-0.3036	280.08	-2.7466
40.01		160.01	-0.3078	280.01	-2.7877
44.97		164.97	-0.3052	284.97	-2.6727
49.96		169.96	-0.2792	289.96	-2.5382
54.96		174.96	-0.2678	294.96	-2.2432
60.08		180.08	-0.2998	300.08	-2.0246
60.01	-1.8956	180.01	-0.3002	300.01	-1.9991
64.97	-2.1352	184.97	-0.2977	304.97	-1.6732
69.96	-2.3845	189.96	-0.2981	309.96	-1.3523
74.96	-2.5430	194.96	-0.2754	314.96	-0.9576
80.08	-2.6836	200.08	-0.3263	320.08	-0.6667
80.01	-2.7343	200.01	-0.3268	320.01	-0.6640
84.97	-2.7751	204.97	-0.3128	324.97	-0.3141
89.96	-2.7018	209.96	-0.3095	329.96	-0.0192
94.96	-2.6036	214.96	-0.2754	334.96	0.3228
100.08	-2.4844	220.08	-0.3111	340.08	0.5303
100.01		220.01	-0.3116	340.01	0.5290
104.97		224.97	-0.3128	344.97	0.7470
109.96		229.96	-0.3473	349.96	0.8994
114.96		234.96	-0.4792	354.96	1.0188
120.08		240.08	-0.9309	360.08	1.0151

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	73: 1	1.0077		1.0002	0.9927	0.9852	0.9890		1.0152
8.97	73: 2	0.9404		0.9404	0.9404	0.9441	0.9479		0.9741
13.96	73: 3	0.8017		0.8129	0.8166	0.8129	0.8129		0.8695
18.96	73: 4	0.6340		0.6565	0.6864	0.6901	0.7125		0.7359
24.08	73: 5	0.3828		0.3791	0.3941	0.3978	0.4240		0.5601
64.01	73: 1	-1.9935	-2.1064	-2.1328	-2.1140	-2.0763	-1.9558	-1.7283	
68.97	73: 2	-2.1803	-2.3265	-2.3528	-2.3227	-2.2628	-2.1052	-1.8759	
73.96	73: 3	-2.3619	-2.4935	-2.5311	-2.5500	-2.5048	-2.2867	-2.1425	
78.96	73: 4	-2.5205	-2.6554	-2.6404	-2.6030	-2.6217	-2.3742	-2.1863	
84.08	73: 5	-2.5822	-2.7324	-2.7812	-2.7812	-2.7399	-2.5447	-2.2374	
124.01	73: 1	-0.6948		-0.7176	-0.8202	-0.9342	-0.6758		
128.97	73: 2	-0.3544		-0.4717	-0.4528	-0.6231	-0.5285		
133.96	73: 3	-0.3055		-0.3245	-0.3890	-0.4839	-0.5180		
138.96	73: 4	-0.3163		-0.2974	-0.2822	-0.3617	-0.5357		
144.08	73: 5	-0.3112		-0.3188	-0.3491	-0.3794	-0.5651		

SMOOTH CYLINDER

REY NO. = 0.385 E+6	K/D = 0.0000	MACH NO. = 0.054
CD = 0.241	CL = -0.059	RUN ID = 74

THETA	CP	THETA	CP	THETA	CP
0.01	1.0312	120.01	-0.9729	240.01	-0.9580
4.96	0.9722	124.96	-0.6723	244.96	-1.3548
10.00	0.9209	130.00	-0.3302	250.00	-2.0541
14.95	0.7997	134.95	-0.2361	254.95	-2.3548
20.09	0.5756	140.09	-0.3207	260.09	-2.4451
20.01	0.6161	140.01	-0.3061	260.01	-2.4145
24.96	0.3132	144.96	-0.3521	264.96	-2.6604
30.00	0.0961	150.00	-0.3065	270.00	-2.8017
34.95	-0.1656	154.95	-0.2961	274.95	-2.6840
40.09	-0.5620	160.09	-0.3259	280.09	-2.7504
40.01		160.01	-0.2750	280.01	-2.7579
44.96		164.96	-0.3565	284.96	-2.7324
50.00		170.00	-0.2942	290.00	-2.5173
54.95		174.95	-0.2453	294.95	-2.2055
60.09		180.09	-0.2980	300.09	-2.0283
60.01	-1.8911	180.01	-0.2710	300.01	-1.9365
64.96	-2.1890	184.96	-0.3565	304.96	-1.7468
70.00	-2.4031	190.00	-0.2982	310.00	-1.3655
74.95	-2.5646	194.95	-0.2770	314.95	-0.9165
80.09	-2.7221	200.09	-0.3258	320.09	-0.6755
80.01	-2.7140	200.01	-0.2909	320.01	-0.6328
84.96	-2.8564	204.96	-0.3644	324.96	-0.3735
90.00	-2.7737	210.00	-0.3022	330.00	0.0018
94.95	-2.5923	214.95	-0.2136	334.95	0.3584
100.09	-2.4232	220.09	-0.3297	340.09	0.5222
100.01		220.01	-0.2710	340.01	0.5613
104.96		224.96	-0.3803	344.96	0.6859
110.00		230.00	-0.3818	350.00	0.9134
114.95		234.95	-0.4674	354.95	1.0819
120.09		240.09	-0.8854	360.09	1.0194

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	74: 1	1.0234		1.0312	1.0312	1.0312	1.0391		1.0350
8.96	74: 2	0.9053		0.8935	0.8817	0.8856	0.8935		0.9448
14.00	74: 3	0.8263		0.8421	0.8421	0.8421	0.8500		0.8859
18.95	74: 4	0.6781		0.7016	0.7252	0.7330	0.7448		0.7964
24.09	74: 5	0.3910		0.3871	0.3949	0.4028	0.4342		0.5732
64.01	74: 1	-1.9463	-2.0883	-2.0686	-2.0647	-2.0173	-1.8596	-1.6757	
68.96	74: 2	-2.2482	-2.4063	-2.4181	-2.3866	-2.3312	-2.1495	-1.9084	
74.00	74: 3	-2.4308	-2.5772	-2.5534	-2.5456	-2.4308	-2.3279	-2.0246	
78.95	74: 4	-2.4858	-2.6355	-2.5764	-2.5961	-2.5095	-2.3047	-2.1019	
84.09	74: 5	-2.5998	-2.7221	-2.7851	-2.7260	-2.6866	-2.4185	-2.0482	
124.01	74: 1	-0.6486		-0.6605	-0.7481	-0.8238	-0.5331		
128.96	74: 2	-0.4517		-0.5156	-0.5634	-0.6591	-0.6153		
134.00	74: 3	-0.3344		-0.3344	-0.3384	-0.4183	-0.5062		
138.95	74: 4	-0.2682		-0.2444	-0.2603	-0.3278	-0.5107		
144.09	74: 5	-0.3140		-0.3219	-0.3618	-0.3936	-0.5927		

SMOOTH   CYLINDER

REY NO. = 0.375 E+6	K/D = 0.0000	MACH NO. = 0.053
CD = 0.509	CL = -1.557	RUN ID = 75

THETA	CP	THETA	CP	THETA	CP
0.01	0.9494	120.01	-0.6293	240.01	-1.3771
4.96	1.0122	124.96	-0.6519	244.96	-1.7293
10.00	1.0204	130.00	-0.5643	250.00	-2.9167
14.97	0.9622	134.97	-0.6537	254.97	-3.2242
20.09	0.8628	140.09	-0.6747	260.09	-3.3180
20.01	0.8746	140.01	-0.6331	260.01	-3.3427
24.96	0.7214	144.96	-0.6019	264.96	-3.4807
30.00	0.5851	150.00	-0.5944	270.00	-3.4810
34.97	0.3196	154.97	-0.6155	274.97	-3.6432
40.09	0.1029	160.09	-0.5903	280.09	-3.6693
40.01		160.01	-0.5905	280.01	-3.6319
44.96		164.96	-0.6091	284.96	-3.5654
50.00		170.00	-0.5509	290.00	-3.2442
54.97		174.97	-0.6185	294.97	-3.1570
60.09		180.09	-0.6645	300.09	-2.8510
60.01	-0.7228	180.01	-0.6159	300.01	-2.8164
64.96	-0.7998	184.96	-0.6386	304.96	-2.5015
70.00	-0.8879	190.00	-0.5888	310.00	-1.9807
74.97	-0.8715	194.97	-0.6311	314.97	-1.7081
80.09	-0.7743	200.09	-0.6310	320.09	-1.2981
80.01	-0.7909	200.01	-0.6117	320.01	-1.2775
84.96	-0.8467	204.96	-0.6218	324.96	-0.9108
90.00	-0.8053	210.00	-0.5509	330.00	-0.4346
94.97	-0.7806	214.97	-0.6268	334.97	-0.1738
100.09	-0.7296	220.09	-0.6268	340.09	0.1442
100.01		220.01	-0.6159	340.01	0.1697
104.96		224.96	-0.5965	344.96	0.4141
110.00		230.00	-0.5971	350.00	0.7095
114.97		234.97	-0.8874	354.97	0.8048
120.09		240.09	-1.4694	360.09	0.9377

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	75: 1	1.0039		1.0039	1.0039	0.9996	0.9955		1.0247
8.96	75: 2	1.0080		0.9872	0.9872	0.9872	0.9872		0.9996
14.00	75: 3	0.9996		1.0121	1.0080	1.0038	0.9872		0.9831
18.97	75: 4	0.8707		0.8499	0.8499	0.8291	0.8291		0.8587
24.09	75: 5	0.7467		0.7301	0.7176	0.7093	0.6969		0.7228
64.01	75: 1	-0.8?0	-0.8404	-0.8740	-0.9370	-0.8656	-0.8530	-0.8887	
68.96	75: 2	-0.8751	-0.9672	-0.9630	-1.0007	-1.0341	-0.9797	-0.9399	
74.00	75: 3	-0.7417	-0.9255	-0.9213	-0.9589	-0.8754	-1.0550	-0.9659	
78.97	75: 4	-0.8006	-0.7838	-0.8506	-0.8632	-0.8715	-0.8924	-0.8482	
84.09	75: 5	-0.7285	-0.8201	-0.7868	-0.8077	-0.7743	-0.7577	-0.7718	
124.01	75: 1	-0.6501		-0.6416	-0.7010	-0.6501	-0.6331		
128.96	75: 2	-0.6526		-0.6526	-0.6822	-0.6737	-0.6484		
134.00	75: 3	-0.5691		-0.5986	-0.6155	-0.5986	-0.6155		
138.97	75: 4	-0.6535		-0.7167	-0.6999	-0.6999	-0.6999		
144.09	75: 5	-0.6408		-0.6660	-0.6660	-0.6660	-0.6450		

SMOOTH   CYLINDER

REY NO. = 0.372 E+6	K/D = 0.0000	MACH NO. = 0.052
CD = 0.583	CL = -1.566	RUN ID = 76

THETA	CP	THETA	CP	THETA	CP
0.00	0.9994	120.00	-0.7068	240.00	-1.3183
5.00	1.0586	125.00	-0.6243	245.00	-1.9612
10.01	1.0164	130.01	-0.7250	250.01	-3.0134
14.99	0.9614	134.99	-0.6471	254.99	-3.2376
20.09	0.8254	140.09	-0.7161	260.09	-3.3071
20.00	1.0206	140.00	-0.6981	260.00	-3.4334
25.00	0.8726	145.00	-0.6119	265.00	-3.4809
30.01	0.6104	150.01	-0.6941	270.01	-3.7278
34.99	0.4325	154.99	-0.6631	274.99	-3.7725
40.09	0.1529	160.09	-0.6317	280.09	-3.6320
40.00		160.00	-0.6281	280.00	-3.7163
45.00		165.00	-0.5855	285.00	-3.6484
50.01		170.01	-0.6544	290.01	-3.3847
54.99		174.99	-0.6236	294.99	-3.1320
60.09		180.09	-0.6054	300.09	-2.8460
60.00	-0.7793	180.00	-0.7005	300.00	-2.7440
65.00	-0.8504	185.00	-0.5940	305.00	-2.3845
70.01	-1.0255	190.01	-0.6501	310.01	-2.0751
74.99	-0.9526	194.99	-0.6364	314.99	-1.6363
80.09	-0.8160	200.09	-0.6348	320.09	-1.2419
80.00	-0.7968	200.00	-0.7048	320.00	-1.2466
85.00	-0.7661	205.00	-0.5898	325.00	-0.7813
90.01	-0.9781	210.01	-0.6544	330.01	-0.4131
94.99	-0.7976	214.99	-0.6193	334.99	-0.0582
100.09	-0.7034	220.09	-0.6348	340.09	0.1902
100.00		220.00	-0.6835	340.00	0.2550
105.00		225.00	-0.5940	345.00	0.5934
110.01		230.01	-0.7313	350.01	0.7542
114.99		234.99	-0.9994	354.99	0.9402
120.09		240.09	-1.5004	360.09	0.9996

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	76: 1	1.0713		1.0375	1.0164	0.9994	0.9868		
9.00	76: 2	1.0713		1.0713	1.0756	1.0713	1.0713		
14.01	76: 3	0.9783		0.9657	0.9572	0.9487	0.9529		
18.99	76: 4	0.8853		0.8726	0.8769	0.8642	0.8600		
24.09	76: 5	0.7093		0.6926	0.6844	0.6636	0.6429		
64.00	76: 1	-0.7920	-0.8683	-0.9361	-0.9615	-0.9530	-0.9615	-0.9512	
69.00	76: 2	-0.9183	-0.9014	-0.9607	-0.9947	-0.9735	-0.9947	-1.0195	
74.01	76: 3	-0.9108	-1.0042	-0.9703	-1.0255	-1.0976	-1.0000	-1.0467	
78.99	76: 4	-0.7404	-0.8083	-0.8126	-0.8041	-0.8041	-0.7828	-0.8363	
84.09	76: 5	-0.6699	-0.7659	-0.8160	-0.8077	-0.8202	-0.8244	-0.8767	
124.00	76: 1	-0.6725		-0.7195	-0.7495	-0.7409	-0.7537		
129.00	76: 2	-0.6290		-0.6376	-0.6590	-0.6590	-0.6461		
134.01	76: 3	-0.6641		-0.6812	-0.7155	-0.7327	-0.6641		
138.99	76: 4	-0.6546		-0.6760	-0.6631	-0.6631	-0.6417		
144.09	76: 5	-0.6232		-0.6865	-0.6865	-0.6738	-0.6823		

SMOOTH CYLINDER

REY NO. = 0.364 E+6	K/D = 0.0000	MACH NO. = 0.051
CD = 0.536	CL = -1.604	RUN ID = 78

THETA	CP	THETA	CP	THETA	CP
0.02	0.9468	120.02	-0.6218	240.02	-1.4446
5.00	0.9947	125.00	-0.7477	245.00	-1.9096
10.01	1.0122	130.01	-0.7736	250.01	-3.3087
15.00	0.9772	135.00	-0.7437	255.00	-3.0842
20.08		140.08		260.08	
20.02	0.8643	140.02	-0.7147	260.02	-3.3573
25.00	0.6807	145.00	-0.6753	265.00	-3.5641
30.01	0.2486	150.01	-0.6978	270.01	-3.7149
35.00	0.3414	155.00	-0.6506	275.00	-3.8170
40.08		160.08		280.08	
40.02		160.02	-0.6506	280.02	-3.8147
45.00		165.00	-0.7276	285.00	-3.7513
50.01		170.01	-0.7187	290.01	-3.5638
55.00		175.00	-0.6404	295.00	-3.1473
60.08		180.08		300.08	
60.02	-0.7542	180.02	-0.6418	300.02	-2.8668
65.00	-0.8913	185.00	-0.7143	305.00	-2.6037
70.01	-0.9496	190.01	-0.6877	310.01	-2.1600
75.00	-0.8842	195.00	-0.6669	315.00	-1.6838
80.08		200.08		320.08	
80.02	-0.7817	200.02	-0.5888	320.02	-1.3317
85.00	-0.9260	205.00	-0.6965	325.00	-1.0247
90.01	-1.0447	210.01	-0.6700	330.01	-0.5673
95.00	-0.8236	215.00	-0.6404	335.00	-0.1682
100.08		220.08		340.08	
100.02		220.02	-0.6065	340.02	0.1685
105.00		225.00	-0.7098	345.00	0.3448
110.01		230.01	-0.7143	350.01	0.6413
115.00		235.00	-1.1133	355.00	0.8510
120.08		240.08		360.08	

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	78: 1	0.9991		0.9991	1.0078	1.0209	1.0383		1.0208
9.00	78: 2	0.9947		0.9641	0.9509	0.9378	0.9290		0.9816
14.01	78: 3	0.9422		0.9422	0.9509	0.9422	0.9422		0.9118
19.00	78: 4	0.8898		0.8942	0.8898	0.8767	0.8679		0.8685
24.08	78: 5								
64.02	78: 1	-0.8375	-0.8506	-0.8900	-0.8550	-0.8944	-0.8550	-0.8971	
69.00	78: 2	-0.9485	-1.0496	-1.0804	-1.0716	-1.0671	-1.0584	-0.9706	
74.01	78: 3	-1.3146	-1.2442	-0.9979	-0.9079	-0.9188	-0.9671	-1.0224	
79.00	78: 4	-0.8402	-0.7393	-0.8095	-0.8315	-0.7788	-0.7612	-0.8812	
84.08	78: 5								
124.02	78: 1	-0.6970		-0.6970	-0.6482	-0.6615	-0.6438		
129.00	78: 2	-0.6975		-0.7686	-0.7641	-0.7907	-0.7686		
134.01	78: 3	-0.9021		-0.7156	-0.7333	-0.6933	-0.6845		
139.00	78: 4	-0.6905		-0.6772	-0.6861	-0.6551	-0.6196		
144.08	78: 5								

REY NO. =	0.331 E+6	K/D	=	0.0000	MACH NO. =	0.046
CD	= 1.042	CL	=	0.003	RUN ID =	82

THETA	CP	THETA	CP	THETA	CP
0.02	1.0261	120.02	-0.9396	240.02	-0.9259
4.98	0.9945	124.98	-0.9910	244.98	-1.0047
9.95	0.9211	129.95	-0.9442	249.95	-0.9880
14.94	0.8056	134.94	-1.0896	254.94	-0.9952
20.10		140.10		260.10	
20.02	0.7053	140.02	-0.9396	260.02	-1.0309
24.98	0.4308	144.98	-1.0019	264.98	-1.1458
29.95	0.2581	149.95	-1.0023	269.95	-1.0937
34.94	-0.0455	154.94	-0.9720	274.94	-1.2659
40.10		160.10		280.10	
40.02		160.02	-0.9366	280.02	-1.1330
44.98		164.98	-1.1267	284.98	-1.3700
49.95		169.95	-0.9880	289.95	-1.3714
54.94		174.94	-1.0908	294.94	-1.3728
60.10		180.10		300.10	
60.02	-1.1044	180.02	-1.0060	300.02	-1.1659
64.98	-1.2855	184.98	-0.9888	304.98	-1.0778
69.95	-1.3281	189.95	-1.0092	309.95	-0.8387
74.94	-1.2083	194.94	-1.0748	314.94	-0.6203
80.10		200.10		320.10	
80.02	-1.2028	200.02	-0.9793	320.02	-0.3038
84.98	-1.3540	204.98	-1.0418	324.98	-0.1121
89.95	-1.3126	209.95	-0.9880	329.95	0.1954
94.94	-1.2446	214.94	-0.9741	334.94	0.4092
100.10		220.10		340.10	
100.02		220.02	-0.9633	340.02	0.6633
104.98		224.98	-1.0206	344.98	0.7544
109.95		229.95	-0.8820	349.95	0.9475
114.94		234.94	-0.9900	354.94	0.9788
120.10		240.10		360.10	

CP   VS.   X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	82: 1	1.0208		1.0367	1.0472	1.0314	1.0261		1.0418
8.98	82: 2	0.9473		0.9159	0.9211	0.9106	0.9159		0.9579
13.95	82: 3	0.8163		0.8582	0.8530	0.8582	0.8635		0.8692
18.94	82: 4	0.6640		0.6640	0.6587	0.6744	0.6902		0.7280
24.10	82: 5								
64.02	82: 1	-1.1786	-1.2793	-1.3270	-1.1945	-1.4436	-1.1945	-1.2082	
68.98	82: 2	-1.3066	-1.5014	-1.5067	-1.2118	-1.2539	-1.4751	-1.2846	
73.95	82: 3	-1.3913	-1.3545	-1.4124	-1.3281	-1.5335	-1.1965	-1.2486	
78.94	82: 4	-1.2083	-1.2293	-1.1029	-1.8248	-1.2030	-1.0396	-1.0843	
84.10	82: 5								
124.02	82: 1	-0.9396		-0.9664	-0.9021	-1.0468	-0.9504		
128.98	82: 2	-1.0392		-1.0445	-0.9380	-0.9220	-1.0551		
133.95	82: 3	-0.9810		-0.9864	-0.9384	-1.0023	-0.9171		
138.94	82: 4	-1.0412		-0.9773	-1.0412	-1.0572	-0.8920		
144.10	32: 5								

SMOOTH   CYLINDER

REY NO. = 8.064 E+6	K/D = 0.0000	MACH NO. = 0.248
CD = 0.511	CL = 0.007	RUN ID = 91

THETA	CP	THETA	CP	THETA	CP
0.02		120.02		240.02	
5.00	0.9942	125.00	-0.6161	245.00	-0.5748
9.99	0.9294	129.99	-0.6252	249.99	-0.5664
14.98	0.8100	134.98	-0.5903	254.98	-0.9694
20.11	0.6281	140.11	-0.5959	260.11	-1.0054
20.02		140.02		260.02	
25.00	0.4088	145.00	-0.6675	265.00	-1.4428
29.99	0.1770	149.99	-0.6600	269.99	-1.6965
34.98	-0.1056	154.98	-0.6129	274.98	-1.9230
40.11	-0.4157	160.11	-0.6183	280.11	-2.1577
40.02		160.02		280.02	
45.00		165.00		285.00	-2.0738
49.99		169.99		289.99	-1.9861
54.98		174.98		294.98	-1.9447
60.11		180.11		300.11	-1.6520
60.02		180.02		300.02	
65.00	-1.7861	185.00	-0.5836	305.00	-1.3904
69.99	-1.8188	189.99	-0.6149	309.99	-1.1258
74.98	-1.8264	194.98	-0.5706	314.98	-0.8521
80.11	-1.9548	200.11	-0.5875	320.11	-0.5309
80.02		200.02		320.02	
85.00	-1.9890	205.00	-0.5723	325.00	-0.1895
89.99	-1.8541	209.99	-0.6071	329.99	0.0834
94.98	-1.5763	214.98	-0.6227	334.98	0.3211
100.11	-1.2478	220.11	-0.6349	340.11	0.5643
100.02		220.02		340.02	
105.00		225.00	-0.5605	345.00	0.8107
109.99		229.99	-0.5639	349.99	0.9297
114.98		234.98	-0.5755	354.98	0.9958
120.11		240.11	-0.6881	360.11	1.0154

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	91: 1								
9.00	91: 2	0.9406		0.9416	0.9455	0.9465	0.9494		0.9560
13.99	91: 3	0.8335		0.8345	0.8350	0.8330	0.8394		0.8616
18.98	91: 4	0.6720		0.6769	0.6760	0.6710	0.6774		0.7272
24.11	91: 5	0.4557		0.4660	0.4709	0.4718	0.4846		0.5487
64.02	91: 1								
69.00	91: 2	-1.6449	-1.8190	-1.9932	-1.9917	-1.9548	-1.7285	-1.7075	
73.99	91: 3	-1.7609	-1.8360	-2.1625	-2.1482	-2.1035	-1.9288	-1.9329	
78.98	91: 4	-1.9569	-2.1552	-2.0075	-2.0927	-2.1429	-1.9731	-1.9630	
84.11	91: 5	-2.0350	-2.2102	-1.8144	-2.0008	-2.1774	-1.8261	-2.0193	
124.02	91: 1								
129.00	91: 2	-0.6842		-0.6646	-0.9396	-0.7058	-0.6195	-0.5875	-0.5551
133.99	91: 3	-0.6791		-0.6507	-0.8215	-0.7153	-0.7021	-0.7184	-0.5776
138.98	91: 4	-0.7292		-0.7012	-0.6571	-0.7184	-0.6894	-0.6217	-0.6257
144.11	91: 5	-0.7280		-0.6529	-0.6373	-0.6865	-0.6817	-0.6183	-0.6378

SMOOTH CYLINDER

REY NO. = 7.146 E+6		K/D = 0.0000		MACH NO. = 0.248	
CD = 0.485		CL = 0.066		RUN ID = 92	

THETA	CP	THETA	CP	THETA	CP
0.00	1.0176	120.00	-0.5853	240.00	-0.5740
4.98	0.9965	124.98	-0.5639	244.98	-0.5533
10.14	0.9208	130.14	-0.5494	250.14	-0.5706
15.04	0.8076	135.04	-0.5978	255.04	-0.6774
20.11	0.6361	140.11	-0.6377	260.11	-0.9482
20.00	0.6097	140.00	-0.6254	260.00	-1.2366
24.98	0.4124	144.98	-0.5683	264.98	-1.4121
30.14	0.1597	150.14	-0.6142	270.14	-1.6436
35.04	-0.1058	155.04	-0.6410	275.04	-1.9666
40.11	-0.4043	160.11	-0.6537	280.11	-2.0359
40.00		160.00	-0.5679	280.00	-2.1427
44.98		164.98	-0.5439	284.98	-2.0596
50.14		170.14	-0.5335	290.14	-1.9837
55.04		175.04	-0.5463	295.04	-1.8685
60.11		180.11	-0.5550	300.11	-1.6528
60.00	-1.5693	180.00	-0.5645	300.00	-1.6730
64.98	-1.7636	184.98	-0.5416	304.98	-1.3913
70.14	-1.8059	190.14	-0.5335	310.14	-1.0972
75.04	-1.8792	195.04	-0.5485	315.04	-0.8326
80.11	-1.9490	200.11	-0.5583	320.11	-0.5215
80.00	-2.0422	200.00	-0.5818	320.00	-0.4975
84.98	-1.9256	204.98	-0.5705	324.98	-0.1982
90.14	-1.6763	210.14	-0.5523	330.14	0.0968
95.04	-1.5763	215.04	-0.6013	335.04	0.3375
100.11	-1.7654	220.11	-0.5907	340.11	0.5602
100.00		220.00	-0.5645	340.00	0.6341
104.98		224.98	-0.5533	344.98	0.8070
110.14		230.14	-0.5452	350.14	0.9188
115.04		235.04	-0.5630	355.04	0.9931
120.11		240.11	-0.5588	360.11	1.0155

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	92: 1	1.0048		1.0059	1.0075	1.0064	1.0075		1.0004
8.98	92: 2	0.9442		0.9442	0.9470	0.9465	0.9481		0.9494
14.14	92: 3	0.8228		0.8283	0.8317	0.8283	0.8350		0.8553
19.04	92: 4	0.6711		0.6672	0.6633	0.6717	0.6744		0.7186
24.11	92: 5	0.4712		0.4723	0.4728	0.4618	0.4784		0.5536
64.00	92: 1	-1.4887	-1.6566	-1.6945	-1.7534	-1.7278	-1.6294		
68.98	92: 2	-1.7091	-1.9480	-1.8275	-1.8447	-1.8780	-1.8236		
74.14	92: 3	-1.8624	-2.0682	-1.9409	-1.9697	-2.0721	-1.9476		
79.04	92: 4	-1.8408	-2.1045	-1.9877	-2.2247	-2.0461	-2.1279		
84.11	92: 5	-1.8294	-2.1733	-1.8145	-1.9705	-2.1546	-1.9154		
124.00	92: 1	-0.6282		-0.6337	-0.7422	-0.7594	-0.6221	-0.6462	-0.6278
128.98	92: 2	-0.7491		-0.5860	-0.7446	-0.6457	-0.6457	-0.6259	-0.6337
134.14	92: 3	-0.6499		-0.6224	-0.6092	-0.7017	-0.6659	-0.6341	-0.6435
139.04	92: 4	-0.6776		-0.6959	-0.6892	-0.7241	-0.7740	-0.7535	-0.6691
144.11	92: 5	-0.6871		-0.6361	-0.6071	-0.6613	-0.7019	-0.7046	-0.6567

SMOOTH CYLINDER

REY NO. = 6.128 E+6   K/D = 0.0000   MACH NO. = 0.247
CD = 0.448   CL = 0.030   RUN ID = 93

THETA	CP	THETA	CP	THETA	CP
0.02	1.0160	120.02	-0.5847	240.02	-0.5975
4.97	1.0013	124.97	-0.5329	244.97	-0.5591
10.02	0.9196	130.02	-0.5547	250.02	-0.5157
14.98	0.7962	134.98	-0.5562	254.98	-0.6026
20.13	0.6223	140.13	-0.6242	260.13	-1.4236
20.02	0.6208	140.02	-0.6182	260.02	-1.3032
24.97	0.4180	144.97	-0.5078	264.97	-1.3890
30.02	0.1494	150.02	-0.5477	270.02	-1.6129
34.98	-0.1359	154.98	-0.5876	274.98	-1.9880
40.13	-0.4457	160.13	-0.5938	280.13	-2.2366
40.02		160.02	-0.5788	280.02	-2.1290
44.97		164.97	-0.4899	284.97	-1.9753
50.02		170.02	-0.5357	290.02	-1.9140
54.98		174.98	-0.5114	294.98	-1.7968
60.13		180.13	-0.5354	300.13	-1.6918
60.02	-1.5645	180.02	-0.5433	300.02	-1.6868
64.97	-1.7238	184.97	-0.4944	304.97	-1.3379
70.02	-1.9033	190.02	-0.5357	310.02	-1.1037
74.98	-1.9294	194.98	-0.5068	314.98	-0.8146
80.13	-1.9925	200.13	-0.5706	320.13	-0.5160
80.02	-2.0377	200.02	-0.5633	320.02	-0.4961
84.97	-1.8049	204.97	-0.5047	324.97	-0.1653
90.02	-1.7128	210.02	-0.5454	330.02	0.1068
94.98	-1.6440	214.98	-0.5502	334.98	0.3663
100.13	-1.3567	220.13	-0.5802	340.13	0.5825
100.02		220.02	-0.5801	340.02	0.5828
104.97		224.97	-0.5188	344.97	0.7666
110.02		230.02	-0.5370	350.02	0.9057
114.98		234.98	-0.5709	354.98	0.9927
120.13		240.13	-0.6033	360.13	1.0237

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	93: 1	1.0044		1.0070	1.0070	1.0063	1.0063		0.9973
8.97	93: 2	0.9422		0.9416	0.9422	0.9422	0.9461		0.9610
14.02	93: 3	0.8240		0.8221	0.8201	0.8188	0.8214		0.8476
18.98	93: 4	0.6601		0.6550	0.6627	0.6601	0.6679		0.7134
24.13	93: 5	0.4594		0.4652	0.4658	0.4703	0.4786		0.5429
64.02	93: 1	-1.4638	-1.6807	-1.6284	-1.7304	-1.5677	-1.7782		
68.97	93: 2	-1.5750	-1.7643	-2.0010	-2.2186	-1.9837	-1.7842		
74.02	93: 3	-1.7992	-2.1013	-1.9518	-2.2216	-2.2455	-2.3503		
78.98	93: 4	-1.7965	-2.0980	-2.2770	-2.0429	-2.1694	-2.2277		
84.13	93: 5	-1.6919	-2.1374	-1.9098	-2.0412	-1.9983	-2.2842		
124.02	93: 1	-0.6104		-0.5828	-0.5007	-0.5751	-0.6124	-0.7540	-0.6097
128.97	93: 2	-0.6393		-0.6246	-0.6189	-0.7178	-0.6189	-0.5559	-0.5854
134.02	93: 3	-0.6640		-0.6139	-0.5657	-0.8472	-0.6653	-0.7338	-0.6770
138.98	93: 4	-0.6011		-0.6636	-0.6849	-0.6752	-0.7113	-0.7237	-0.6680
144.13	93: 5	-0.6065		-0.6352	-0.6378	-0.6626	-0.7034	-0.6621	-0.6397

SMOOTH CYLINDER

REY NO. = 5.098 E+6		K/D = 0.0000		MACH NO. = 0.247	
CD = 0.451		CL = 0.039		RUN ID = 94	

THETA	CP	THETA	CP	THETA	CP
0.02	1.0178	120.02	-0.5638	240.02	-0.5467
4.98	0.9957	124.98	-0.5517	244.98	-0.6059
10.03	0.9212	130.03	-0.5475	250.03	-0.5981
14.97	0.7979	134.97	-0.5694	254.97	-0.7184
20.14	0.6117	140.14	-0.5971	260.14	-1.3848
20.02	0.6202	140.02	-0.5796	260.02	-1.1545
24.98	0.3995	144.98	-0.5646	264.98	-1.5054
30.03	0.1502	150.03	-0.5444	270.03	-1.7206
34.97	-0.1226	154.97	-0.5629	274.97	-1.9735
40.14	-0.4605	160.14	-0.5654	280.14	-2.1993
40.02		160.02	-0.5568	280.02	-2.0539
44.98		164.98	-0.5363	284.98	-2.1088
50.03		170.03	-0.5312	290.03	-1.9826
54.97		174.97	-0.5278	294.97	-1.8565
60.14		180.14	-0.5394	300.14	-1.6905
60.02	-1.6055	180.02	-0.5227	300.02	-1.6266
64.98	-1.7802	184.98	-0.5301	304.98	-1.4154
70.03	-1.9043	190.03	-0.5312	310.03	-1.0917
74.97	-1.9986	194.97	-0.5341	314.97	-0.8182
80.14	-2.0952	200.14	-0.5738	320.14	-0.5099
80.02	-2.1078	200.02	-0.5173	320.02	-0.4734
84.98	-1.9226	204.98	-0.5707	324.98	-0.2023
90.03	-1.7120	210.03	-0.5545	330.03	0.1129
94.97	-1.8416	214.97	-0.5622	334.97	0.3500
100.14	-1.4689	220.14	-0.5778	340.14	0.5774
100.02		220.02	-0.5343	340.02	0.5977
104.98		224.98	-0.5707	344.98	0.7671
110.03		230.03	-0.5639	350.03	0.9074
114.97		234.97	-0.5809	354.97	0.9903
120.14		240.14	-0.6122	360.14	1.0239

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	94: 1	1.0038		1.0046	1.0030	1.0030	1.0022		1.0038
8.98	94: 2	0.9386		0.9378	0.9386	0.9425	0.9433		0.9505
14.03	94: 3	0.8262		0.8223	0.8208	0.8208	0.8231		0.8585
18.97	94: 4	0.6705		0.6651	0.6635	0.6697	0.6838		0.7314
24.14	94: 5	0.4500		0.4625	0.4649	0.4664	0.4861		0.5555
64.02	94: 1	-1.4952	-1.6311	-1.8990	-2.0170	-1.9176	-2.0286		
68.98	94: 2	-1.6331	-2.1998	-2.3172	-2.1685	-1.8303	-1.9110		
74.03	94: 3	-1.6355	-1.9097	-2.1808	-2.4713	-2.5329	-2.4589		
78.97	94: 4	-1.6740	-1.9235	-2.4014	-2.6298	-2.4194	-2.2176		
84.14	94: 5	-1.7715	-2.1423	-1.9640	-2.1769	-2.2319	-2.1832		
124.02	94: 1	-0.6762		-0.5325	-0.7418	-0.8824	-0.7496	-0.6475	-0.5832
128.98	94: 2	-0.5623		-0.6425	-0.6300	-0.6908	-0.7149	-0.6754	-0.7012
134.03	94: 3	-0.5444		-0.6428	-0.6095	-0.4824	-0.5421	-0.6090	-0.5779
138.97	94: 4	-0.5567		-0.5606	-0.6150	-0.7418	-0.6920	-0.6114	-0.5770
144.14	94: 5	-0.5983		-0.6374	-0.6506	-0.7077	-0.6632	-0.6726	-0.5746

REY NO. = 4.129 E+6   K/D = 0.0000   MACH NO. = 0.248
CD = 0.415   CL = 0.043   RUN ID = 95

THETA	CP	THETA	CP	THETA	CP
0.02	1.0222	120.02	-0.6202	240.02	-0.5246
4.97	0.9960	124.97	-0.5390	244.97	-0.5846
9.99	0.9170	129.99	-0.5571	249.99	-0.5819
14.98	0.8023	134.98	-0.5063	254.98	-0.7280
20.09	0.6144	140.09	-0.5399	260.09	-0.8539
20.02	0.5999	140.02	-0.5816	260.02	-1.0730
24.97	0.3981	144.97	-0.5313	264.97	-1.4633
29.99	0.1403	149.99	-0.5387	269.99	-1.7165
34.98	-0.1078	154.98	-0.5160	274.98	-1.9886
40.09	-0.4502	160.09	-0.5020	280.09	-1.9643
40.02		160.02	-0.4875	280.02	-1.9717
44.97		164.97	-0.4887	284.97	-2.0183
49.99		169.99	-0.5032	289.99	-1.9594
54.98		174.98	-0.4961	294.98	-1.8495
60.09		180.09	-0.4797	300.09	-1.5716
60.02	-1.7462	180.02	-0.4992	300.02	-1.5689
64.97	-1.7672	184.97	-0.5003	304.97	-1.3608
69.99	-1.9364	189.99	-0.5032	309.99	-1.0814
74.98	-1.9770	194.98	-0.4845	314.98	-0.8186
80.09	-2.0940	200.09	-0.4681	320.09	-0.4714
80.02	-1.7717	200.02	-0.4924	320.02	-0.4289
84.97	-1.8936	204.97	-0.5342	324.97	-0.1592
89.99	-1.6757	209.99	-0.5382	329.99	0.1189
94.98	-1.4237	214.98	-0.5347	334.98	0.3529
100.09	-1.2370	220.09	-0.4845	340.09	0.5873
100.02		220.02	-0.5167	340.02	0.6165
104.97		224.97	-0.5342	344.97	0.7794
109.99		229.99	-0.5469	349.99	0.9162
114.98		234.98	-0.5492	354.98	0.9893
120.09		240.09	-0.4961	360.09	1.0260

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	95: 1	1.0036		1.0036	1.0045	1.0075	1.0094		1.0153
8.97	95: 2	0.9388		0.9340	0.9359	0.9359	0.9379		0.9361
13.99	95: 3	0.8216		0.8089	0.8099	0.8128	0.8206		0.8580
18.98	95: 4	0.6726		0.6600	0.6610	0.6600	0.6677		0.7257
24.09	95: 5	0.4492		0.4434	0.4492	0.4579	0.4734		0.5381
64.02	95: 1	-1.7443	-2.0700	-2.1874	-2.1717	-2.1424	-2.1071		
68.97	95: 2	-1.6172	-2.1870	-2.3722	-2.4013	-2.3819	-2.3461		
73.99	95: 3	-1.6999	-2.3805	-2.5899	-2.6357	-2.6201	-2.5374		
78.98	95: 4	-1.6819	-2.3062	-2.5599	-2.5792	-2.6451	-2.5725		
84.09	95: 5	-1.8862	-2.5463	-2.6990	-2.6130	-2.5463	-2.2950		
124.02	95: 1	-0.6332		-0.6167	-0.5505	-0.4775	-0.7062	-0.6299	-0.5587
128.97	95: 2	-0.5362		-0.5294	-0.4618	-0.4589	-0.5690	-0.5555	-0.5119
133.99	95: 3	-0.5503		-0.5183	-0.4767	-0.4718	-0.5387	-0.5926	-0.5596
138.98	95: 4	-0.5353		-0.4688	-0.4206	-0.4688	-0.5555	-0.5821	-0.5608
144.09	95: 5	-0.5625		-0.4818	-0.4366	-0.4375	-0.6693	-0.6012	-0.5453

SMOOTH CYLINDER

REY NO. = 3.064 E+6		K/D = 0.0000		MACH NO. = 0.248	
CD = 0.381		CL = 0.271		RUN ID = 96	

THETA	CP	THETA	CP	THETA	CP
0.01		120.01		240.01	
5.05	0.9968	125.05	-0.5008	245.05	-0.4599
9.96	0.9216	129.96	-0.5134	249.96	-0.4928
14.97	0.7707	134.97	-0.4454	254.97	-0.5826
20.13	0.5849	140.13	-0.5554	260.13	-0.9016
20.01		140.01		260.01	
25.05	0.3680	145.05	-0.4965	265.05	-1.1956
29.96	0.1554	149.96	-0.5027	269.96	-1.5387
34.97	-0.2085	154.97	-0.4538	274.97	-1.8509
40.13	-0.5110	160.13	-0.5224	280.13	-1.9072
40.01		160.01		280.01	
45.05		165.05	-0.4243	285.05	-1.9049
49.96		169.96	-0.4585	289.96	-1.8853
54.97		174.97	-0.4472	294.97	-1.7800
60.13		180.13	-0.4017	300.13	-1.5309
60.01		180.01		300.01	
65.05	-1.8189	185.05	-0.4560	305.05	-1.3116
69.96	-1.9259	189.96	-0.4585	309.96	-1.0799
74.97	-2.4840	194.97	-0.4157	314.97	-0.7600
80.13	-2.3844	200.13	-0.4371	320.13	-0.4272
80.01		200.01		320.01	
85.05	-2.4217	205.05	-0.4243	325.05	-0.1303
89.96	-1.7798	209.96	-0.4862	329.96	0.1093
94.97	-2.0046	214.97	-0.4222	334.97	0.3811
100.13	-1.7302	220.13	-0.4424	340.13	0.6158
100.01		220.01		340.01	
105.05		225.05	-0.4428	345.05	0.7978
109.96		229.96	-0.4862	349.96	0.9140
114.97		234.97	-0.4157	354.97	1.0022
120.13		240.13	-0.4332	360.13	1.0193

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	96: 1								
9.05	96: 2	0.9348		0.9414	0.9414	0.9414	0.9427		0.9600
13.96	96: 3	0.8292		0.8265	0.8278	0.8278	0.8278		0.8666
18.97	96: 4	0.6365		0.6431	0.6536	0.6536	0.6615		0.7212
24.13	96: 5	0.4142		0.4208	0.4287	0.4313	0.4444		0.5450
64.01	96: 1								
69.05	96: 2	-1.9099	-2.2119	-2.3200	-2.3042	-2.2725	-2.2488		
73.96	96: 3	-1.8243	-2.3451	-2.4901	-2.4901	-2.4532	-2.4875		
78.97	96: 4	-2.2079	-2.5576	-2.6338	-2.5484	-2.5090	-2.5629		
84.13	96: 5	-2.1850	-2.6559	-2.6887	-2.5378	-2.5719	-2.6349		
124.01	96: 1								
129.05	96: 2	-0.5385		-0.4347	-0.3650	-0.3335	-0.4373	-0.5522	-0.5021
133.96	96: 3	-0.5184		-0.4304	-0.3819	-0.3451	-0.4331	-0.5627	-0.5231
138.97	96: 4	-0.4970		-0.4224	-0.3765	-0.3674	-0.4381	-0.5615	-0.5208
144.13	96: 5	-0.5589		-0.4244	-0.3760	-0.3878	-0.4570	-0.5657	-0.5368

SMOOTH   CYLINDER

REY NO. = 2.050 E+6   K/D = 0.0000   MACH NO. = 0.248
CD = 0.278   CL = -0.203   RUN ID = 98

THETA	CP	THETA	CP	THETA	CP
0.01	1.0293	120.01	-0.3788	240.01	-0.4214
5.01		125.01		245.01	
10.00	0.9314	130.00	-0.3528	250.00	-1.1836
14.99	0.8010	134.99	-0.3500	254.99	-1.5399
20.13	0.6188	140.13	-0.3723	260.13	-2.0658
20.01	0.6762	140.01	-0.3860	260.01	-2.1266
25.01		145.01		265.01	
30.00	0.1681	150.00	-0.3691	270.00	-2.4640
34.99	-0.1327	154.99	-0.3736	274.99	-2.5119
40.13	-0.4651	160.13	-0.3850	280.13	-2.6039
40.01		160.01	-0.4016	280.01	-2.7033
45.01		165.01		285.01	
50.00		170.00	-0.3860	290.00	-2.3447
54.99		174.99	-0.4080	294.99	-2.1216
60.13		180.13	-0.3940	300.13	-1.9151
60.01	-1.5637	180.01	-0.3937	300.01	-1.9613
65.01		185.01		305.01	
70.00	-2.0859	190.00	-0.3860	310.00	-1.2631
74.99	-2.3190	194.99	-0.3802	314.99	-0.9225
80.13	-2.4454	200.13	-0.4020	320.13	-0.6061
80.01	-2.1582	200.01	-0.4055	320.01	-0.6416
85.01		205.01		325.01	
90.00	-1.7603	210.00	-0.3919	330.00	0.0314
94.99	-1.9393	214.99	-0.3862	334.99	0.3146
100.13	-1.7877	220.13	-0.3960	340.13	0.5483
100.01		220.01	-0.3996	340.01	0.5400
105.01		225.01		345.01	
110.00		230.00	-0.3880	350.00	0.8886
114.99		234.99	-0.3981	354.99	0.9876
120.13		240.13	-0.4000	360.13	1.0213

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	98: 1	1.0253		1.0253	1.0253	1.0234	1.0234		1.0253
9.01	98: 2								
14.00	98: 3	0.8434		0.8375	0.8356	0.8336	0.8356		0.8711
19.99	98: 4	0.6700		0.6661	0.6661	0.6641	0.6680		0.7303
24.13	98: 5	0.4535		0.4495	0.4455	0.4455	0.4495		0.5483
64.01	98: 1	-1.4689	-1.7454	-1.9192	-1.9627	-1.9469	-1.9133		
69.01	98: 2								
74.00	98: 3	-1.8356	-2.2228	-2.4379	-2.4672	-2.4164	-2.4066		
78.99	98: 4	-1.9820	-2.3785	-2.6005	-2.6144	-2.5430	-2.5727		
84.13	98: 5	-2.0314	-2.4593	-2.6842	-2.6822	-2.5807	-2.6543		
124.01	98: 1	-0.3466		-0.6418	-0.5828	-0.3505	-0.4470	-0.6309	-0.4925
129.01	98: 2								
134.00	98: 3	-0.3555		-0.4159	-0.3886	-0.3146	-0.3555	-0.5405	-0.513?
138.99	98: 4	-0.3677		-0.4092	-0.3973	-0.3479	-0.3993	-0.5507	-0.521?
144.13	98: 5	-0.3612		-0.3988	-0.3949	-0.3592	-0.4246	-0.5670	-0.54??

SMOOTH   CYLINDER

THETA	CP	THETA	CP	THETA	CP
0.02		120.02		240.02	
4.99	1.0455	124.99	-0.2928	244.99	-0.3265
10.00	0.9354	130.00	-0.2909	250.00	-0.5068
14.97	0.8262	134.97	-0.3133	254.97	-1.1703
20.13	0.6263	140.13	-0.2918	260.13	-1.2140
20.02		140.02		260.02	
24.99	0.4551	144.99	-0.2735	264.99	-1.8599
30.00	0.1371	150.00	-0.2970	270.00	-2.1179
34.97	-0.1064	154.97	-0.3044	274.97	-2.5131
40.13	-0.4671	160.13	-0.3167	280.13	-2.3476
40.02		160.02		280.02	
44.99		164.99	-0.0183	284.99	-2.2081
50.00		170.00	-0.0611	290.00	-2.2330
54.97		174.97	-0.1296	294.97	-2.0652
60.13		180.13	-0.0568	300.13	-1.7539
60.02		180.02		300.02	
64.99	-1.9457	184.99	-0.2519	304.99	-1.4000
70.00	-2.2184	190.00	-0.2965	310.00	-1.2103
74.97	-2.2122	194.97	-0.2790	314.97	-0.9057
80.13	-2.3655	200.13	-0.3162	320.13	-0.5467
80.02		200.02		320.02	
84.99	-2.4469	204.99	-0.2718	324.99	-0.1550
90.00	-1.7425	210.00	-0.3315	330.00	0.0573
94.97	-1.7417	214.97	-0.2989	334.97	0.3156
100.13	-1.6391	220.13	-0.3112	340.13	0.5628
100.02		220.02		340.02	
104.99		224.99	-0.2718	344.99	0.8073
110.00		230.00	-0.3365	350.00	0.8957
114.97		234.97	-0.3288	354.97	0.9858
120.13		240.13	-0.3910	360.13	1.0155

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	103: 1								
8.99	103: 2	1.0007		1.0106	1.0156	1.0256	1.0405		1.0156
14.00	103: 3	0.8402		0.8502	0.8502	0.8502	0.8552		0.8658
18.97	103: 4	0.6966		0.6966	0.6966	0.7016	0.7016		0.7425
24.13	103: 5	0.4517		0.4616	0.4666	0.4666	0.4816		0.5578
64.02	103: 1								
68.99	103: 2	-1.9258	-2.0751	-2.0253	-2.0054	-2.0801	-2.0054		
74.00	103: 3	-2.1031	-2.2736	-2.2084	-2.2284	-2.1933	-2.2635		
78.97	103: 4	-2.1425	-2.2621	-2.4314	-2.4762	-2.3318	-2.3866		
84.13	103: 5	-2.2955	-2.5602	-2.5453	-2.5952	-2.5003	-2.5403		
124.02	103: 1								
128.99	103: 2	-0.3181		-0.3231	-0.2834	-0.2933	-0.3776	-0.5551	-0.4507
134.00	103: 3	-0.3020		-0.3569	-0.3170	-0.3569	-0.3819	-0.5018	-0.4968
138.97	103: 4	-0.2548		-0.3392	-0.3689	-0.3590	-0.3342	-0.5429	-0.4931
144.13	103: 5	-0.3167		-0.3465	-0.3465	-0.3366	-0.3614	-0.5506	-0.5057

ROUGH CYLINDER   (NO. 6 MESH SCREEN)

REY NO. = 6.590 E+6	K/D = 0.0100	MACH NO. = 0.198
CD = 1.061	CL = -0.022	RUN ID = 132

THETA	CP	THETA	CP	THETA	CP
0.02	1.0084	120.02	-1.0303	240.02	-1.0026
5.02	0.9876	125.02	-1.0268	245.02	-1.0106
9.96	0.9183	129.96	-1.0648	249.96	-1.0052
14.92	0.7951	134.92	-1.0708	254.92	-1.0446
19.94	0.6271	139.94	-1.0314	259.94	-1.0053
20.02	0.6601	140.02	-1.0422	260.02	-0.9838
25.02	0.4633	145.02	-1.0583	265.02	-1.0544
29.96	0.2294	149.96	-0.9941	269.96	-1.1870
34.92	-0.0282	154.92	-1.0803	274.92	-1.3440
39.94	-0.2922	159.94	-1.0920	279.94	-1.4648
40.02		160.02	-1.1070	280.02	-1.4939
45.02		165.02	-1.1172	285.02	-1.5628
49.96		169.96	-1.0866	289.96	-1.4953
54.92		174.92	-1.1277	294.92	-1.4603
59.94		179.94	-1.1410	299.94	-1.2691
60.02	-1.2359	180.02	-1.0872	300.02	-1.3098
65.02	-1.4155	185.02	-1.0912	305.02	-1.1265
69.96	-1.4789	189.96	-1.1887	309.96	-0.9043
74.92	-1.5195	194.92	-1.0969	314.92	-0.6569
79.94	-1.5230	199.94	-1.0651	319.94	-0.3665
80.02	-1.5276	200.02	-1.0796	320.02	-0.3367
85.02	-1.3427	205.02	-1.0981	325.02	-0.0925
89.96	-1.1532	209.96	-1.1211	329.96	0.1779
94.92	-1.0916	214.92	-1.0869	334.92	0.3996
99.94	-1.0345	219.94	-1.0475	339.94	0.6136
100.02		220.02	-1.0163	340.02	0.5824
105.02		225.02	-1.0360	345.02	0.7515
109.96		229.96	-1.0566	349.96	0.8869
114.92		234.92	-1.0284	354.92	0.9721
119.94		239.94	-0.9999	359.94	1.0082

				CP	VS.	X/D				
THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5		4.0
4.02	132: 1	1.0000		1.0023	1.0023	0.9992	1.0000			0.9855
9.02	132: 2	0.9408		0.9400	0.9416	0.9385	0.9408			0.9301
13.96	132: 3	0.8391		0.8407	0.8399	0.8353	0.8399			0.8385
18.92	132: 4	0.6828		0.6890	0.6905	0.6798	0.6882			0.7035
23.94	132: 5	0.4968		0.4930	0.5014	0.4891	0.4999			0.5370
64.02	132: 1	-1.2946	-1.3982	-1.3456	-1.3022	-1.3007	-1.2763	-1.2276		
69.02	132: 2	-1.3887	-1.5099	-1.4569	-1.4209	-1.3604	-1.4132	-1.3917		
73.96	132: 3	-1.4397	-1.5496	-1.4927	-1.4750	-1.4328	-1.3790	-1.4135		
78.92	132: 4	-1.4456	-1.5434	-1.4733	-1.4648	-1.4317	-1.4548	-1.4117		
83.94	132: 5	-1.3083	-1.4316	-1.3719	-1.2891	-1.2700	-1.3052	-1.3649		
124.02	132: 1			-1.0157	-1.0217	-1.0073	-1.0058	-0.9523		-0.9675
129.02	132: 2			-1.0675	-1.0415	-1.0179	-1.0446	-1.0068		-0.9976
133.96	132: 3			-1.0652	-1.0728	-1.0300	-1.0216	-0.9423		-0.9277
138.92	132: 4			-1.0695	-1.0841	-1.0412	-1.0680	-1.0369		-1.0523
143.94	132: 5			-1.0401	-1.0539	-1.0127	-0.9844	-1.0598		-1.0283

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 5.105 E+6   K/D = 0.0100   MACH NO. = 0.198
CD = 1.055   CL = -0.028   RUN ID = 133

THETA	CP	THETA	CP	THETA	CP
0.01	1.0098	120.01	-0.9659	240.01	-1.0370
4.97	0.9887	124.97	-1.0423	244.97	-1.0513
9.93	0.9153	129.93	-1.0477	249.93	-0.9910
14.92	0.7945	134.92	-1.0507	254.92	-1.0184
20.00	0.6268	140.00	-1.0646	260.00	-1.0265
20.01	0.6605	140.01	-1.0501	260.01	-0.9927
24.97	0.4541	144.97	-1.0669	264.97	-1.0936
29.93	0.2297	149.93	-1.1031	269.93	-1.1592
34.92	-0.0258	154.92	-1.0963	274.92	-1.3578
40.00	-0.2999	160.00	-1.0432	280.00	-1.5013
40.01		160.01	-1.1263	280.01	-1.5348
44.97		164.97	-1.1257	284.97	-1.5956
49.93		169.93	-1.1363	289.93	-1.5007
54.92		174.92	-1.1180	294.92	-1.4414
60.00		180.00	-1.1326	300.00	-1.2959
60.01	-1.2505	180.01	-1.1124	300.01	-1.3315
64.97	-1.4243	184.97	-1.1186	304.97	-1.1699
69.93	-1.5119	189.93	-1.1055	309.93	-0.9157
74.92	-1.5593	194.92	-1.0938	314.92	-0.6618
80.00	-1.4796	200.00	-1.0463	320.00	-0.3664
80.01	-1.5348	200.01	-1.0340	320.01	-0.3469
84.97	-1.3180	204.97	-1.1005	324.97	-0.0966
89.93	-1.1751	209.93	-1.1184	329.93	0.1730
94.92	-1.0607	214.92	-1.0546	334.92	0.3948
100.00	-1.0289	220.00	-1.0543	340.00	0.6129
100.01		220.01	-1.0747	340.01	0.5811
104.97		224.97	-1.0392	344.97	0.7505
109.93		229.93	-1.0069	349.93	0.8885
114.92		234.92	-1.0224	354.92	0.9755
120.00		240.00	-0.9918	360.00	1.0098

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	133: 1	0.9999		1.0009	1.0009	0.9989	0.9999		0.9860
8.97	133: 2	0.9424		0.9434	0.9444	0.9424	0.9414		0.9324
13.93	133: 3	0.8377		0.8407	0.8377	0.8337	0.8357		0.8407
18.92	133: 4	0.6879		0.6859	0.6929	0.6808	0.6869		0.7058
24.00	133: 5	0.4899		0.4949	0.5008	0.4859	0.5008		0.5385
64.01	133: 1	-1.3031	-1.4201	-1.3547	-1.2664	-1.2803	-1.2892	-1.2598	
68.97	133: 2	-1.4253	-1.5378	-1.4484	-1.4152	-1.3751	-1.4152	-1.4105	
73.93	133: 3	-1.4174	-1.5467	-1.4840	-1.4323	-1.4323	-1.4244	-1.4409	
78.92	133: 4	-1.4305	-1.5392	-1.4879	-1.4275	-1.4406	-1.4134	-1.4323	
84.00	133: 5	-1.2961	-1.4211	-1.2534	-1.2763	-1.2981	-1.3358	-1.3167	
124.01	133: 1			-1.0383	-0.9839	-0.9938	-1.0195	-0.9636	-0.9765
128.97	133: 2			-1.0589	-1.0539	-1.0039	-1.0499	-1.0523	-1.0201
133.93	133: 3			-1.0466	-1.0506	-1.0357	-1.0129	-1.0119	-0.9153
138.92	133: 4			-1.0492	-1.0673	-1.0653	-1.0262	-1.0335	-1.0043
144.00	133: 5			-1.0047	-1.0284	-1.0501	-1.0571	-1.0325	-0.9581

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 4.185 E+6   K/D = 0.0100   MACH NO. = 0.204
      CD = 1.051   CL = -0.032   RUN ID = 134

THETA	CP	THETA	CP	THETA	CP
0.02	1.0104	120.02	-1.0318	240.02	-1.0183
4.96	0.9887	124.96	-1.0372	244.96	-1.0367
9.95	0.9186	129.95	-1.0411	249.95	-1.0127
14.90	0.7965	134.90	-1.0544	254.90	-1.0496
20.00	0.6287	140.00	-1.0747	260.00	-1.0361
20.02	0.6694	140.02	-1.0292	260.02	-1.0521
24.96	0.4580	144.96	-1.0735	264.96	-1.0720
29.95	0.2288	149.95	-1.0498	269.95	-1.1496
34.90	-0.0324	154.90	-1.0807	274.90	-1.3702
40.00	-0.3045	160.00	-1.1198	280.00	-1.4900
40.02		160.02	-1.0302	280.02	-1.4962
44.96		164.96	-1.0907	284.96	-1.5902
49.95		169.95	-1.1271	289.95	-1.5432
54.90		174.90	-1.1094	294.90	-1.4802
60.00		180.00	-1.1098	300.00	-1.3020
60.02	-1.2554	180.02	-1.1148	300.02	-1.3373
64.96	-1.4389	184.96	-1.0631	304.96	-1.1772
69.95	-1.4762	189.95	-1.0913	309.95	-0.9305
74.90	-1.5147	194.90	-1.1154	314.90	-0.6698
80.00	-1.5248	200.00	-1.0788	320.00	-0.3853
80.02	-1.4269	200.02	-1.0457	320.02	-0.3489
84.96	-1.3450	204.96	-1.0775	324.96	-0.1050
89.95	-1.2081	209.95	-1.0723	329.95	0.1597
94.90	-1.0699	214.90	-1.0771	334.90	0.3969
100.00	-1.0413	220.00	-1.0503	340.00	0.6145
100.02		220.02	-1.0612	340.02	0.5895
104.96		224.96	-1.0751	344.96	0.7534
109.95		229.95	-1.0282	349.95	0.8924
114.90		234.90	-1.0424	354.90	0.9781
120.00		240.00	-1.0551	360.00	1.0139

CP   VS.   X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	134: 1	1.0008		1.0020	1.0032	1.0032	1.0008		0.9973
8.96	134: 2	0.9431		0.9419	0.9431	0.9407	0.9431		0.9383
13.95	134: 3	0.8400		0.8412	0.8400	0.8352	0.8388		0.8447
18.90	134: 4	0.6853		0.6817	0.6853	0.6757	0.6841		0.7102
24.00	134: 5	0.4920		0.4992	0.4992	0.4849	0.5003		0.5372
64.02	134: 1	-1.3007	-1.3710	-1.3687	-1.3270	-1.2936	-1.2924	-1.2909	
68.96	134: 2	-1.4209	-1.5398	-1.4593	-1.4665	-1.4125	-1.4161	-1.3714	
73.95	134: 3	-1.4369	-1.5906	-1.4535	-1.4404	-1.4249	-1.4392	-1.4132	
78.90	134: 4	-1.4358	-1.5959	-1.4932	-1.4454	-1.4394	-1.4358	-1.4145	
84.00	134: 5	-1.2824	-1.4559	-1.2539	-1.3110	-1.3157	-1.3038	-1.3341	
124.02	134: 1			-1.0328	-1.0173	-1.0339	-1.0316	-1.0028	-0.9610
128.96	134: 2			-1.0712	-1.0927	-1.0436	-1.0580	-0.9887	-0.9875
133.95	134: 3			-1.0640	-1.0391	-1.0130	-1.0557	-1.0318	-1.0127
138.90	134: 4			-1.0783	-1.0879	-1.1045	-1.0807	-1.0400	-0.9898
144.00	134: 5			-1.0440	-1.0393	-1.0606	-1.0677	-1.0194	-0.9862

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 3.049 E+6   K/D = 0.0100   MACH NO. = 0.198
CD = 1.043   CL = -0.030   RUN ID = 135

THETA	CP	THETA	CP	THETA	CP
0.00	1.0097	120.00	-1.0136	240.00	-1.0255
4.96	0.9892	124.96	-1.0231	244.96	-1.0258
9.95	0.9182	129.95	-1.0015	249.95	-1.0043
14.90	0.7957	134.90	-1.0211	254.90	-1.0067
19.97	0.6303	139.97	-1.0323	259.97	-1.0030
20.00	0.6667	140.00	-1.0558	260.00	-1.0409
24.96	0.4621	144.96	-1.0620	264.96	-1.0916
29.95	0.2382	149.95	-1.0214	269.95	-1.1575
34.90	-0.0151	154.90	-1.0758	274.90	-1.3068
39.97	-0.2906	159.97	-1.0386	279.97	-1.5062
40.00		160.00	-1.0580	280.00	-1.5186
44.96		164.96	-1.1079	284.96	-1.5878
49.95		169.95	-1.0941	289.95	-1.5170
54.90		174.90	-1.0951	294.90	-1.4480
59.97		179.97	-1.0735	299.97	-1.2877
60.00	-1.2857	180.00	-1.0784	300.00	-1.3574
64.96	-1.4201	184.96	-1.1627	304.96	-1.1823
69.95	-1.4500	189.95	-1.0602	309.95	-0.9099
74.90	-1.5406	194.90	-1.0577	314.90	-0.6304
79.97	-1.4844	199.97	-1.0601	319.97	-0.3679
80.00	-1.4776	200.00	-1.0784	320.00	-0.3658
84.96	-1.3757	204.96	-1.0960	324.96	-0.1077
89.95	-1.1710	209.95	-1.0653	329.95	0.1720
94.90	-1.0500	214.90	-1.0526	334.90	0.4115
99.97	-1.0205	219.97	-1.0315	339.97	0.6201
100.00		220.00	-1.0904	340.00	0.5814
104.96		224.96	-1.0344	344.96	0.7530
109.95		229.95	-0.9806	349.95	0.8944
114.90		234.90	-1.0798	354.90	0.9809
119.97		239.97	-1.0551	359.97	1.0166

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	135: 1	1.0012		1.0012	1.0012	1.0012	0.9995		0.9961
8.96	135: 2	0.9430		0.9447	0.9447	0.9413	0.9413		0.9430
13.95	135: 3	0.8369		0.8420	0.8420	0.8352	0.8369		0.8504
18.90	135: 4	0.6870		0.6904	0.6955	0.6836	0.6921		0.7174
23.97	135: 5	0.4925		0.4942	0.4993	0.4892	0.4976		0.5528
64.00	135: 1	-1.3011	-1.4119	-1.3113	-1.3318	-1.3079	-1.2926	-1.3019	
68.96	135: 2	-1.4013	-1.5570	-1.4663	-1.4304	-1.4201	-1.4253	-1.3808	
73.95	135: 3	-1.4042	-1.5889	-1.4364	-1.3669	-1.4245	-1.3991	-1.3949	
78.90	135: 4	-1.4063	-1.5321	-1.3791	-1.3995	-1.3723	-1.3451	-1.4310	
83.97	135: 5	-1.2793	-1.4071	-1.3146	-1.2978	-1.2962	-1.3029	-1.3180	
124.00	135: 1			-1.0116	-1.0422	-1.0269	-1.0320	-1.0272	-0.9437
128.96	135: 2			-1.0484	-1.0467	-1.0348	-1.0109	-1.0190	-1.0224
133.95	135: 3			-1.0096	-0.9944	-1.0265	-1.0163	-1.0043	-0.9823
138.90	135: 4			-1.0267	-1.0420	-1.0453	-1.0013	-1.0169	-0.9608
143.97	135: 5			-1.0670	-1.0487	-1.0670	-1.0420	-1.0147	-0.9828

ROUGH CYLINDER   (NO. 6 MESH SCREEN)

REY NO. = 2.537 E+6   K/D = 0.0100   MACH NO. = 0.196
    CD = 1.048   CL   = -0.019   RUN ID =   136

THETA	CP	THETA	CP	THETA	CP
0.01	1.0138	120.01	-1.0248	240.01	-1.0082
4.94	0.9894	124.94	-1.0018	244.94	-0.9670
9.95	0.9167	129.95	-1.0182	249.95	-1.0270
14.90	0.7947	134.90	-0.9970	254.90	-0.9847
19.99	0.6271	139.99	-1.0486	259.99	-1.0292
20.01	0.6599	140.01	-1.0526	260.01	-1.0413
24.94	0.4693	144.94	-1.0150	264.94	-1.0283
29.95	0.2340	149.95	-1.1006	269.95	-1.1462
34.90	-0.0140	154.90	-1.0673	274.90	-1.2737
39.99	-0.3022	159.99	-1.0771	279.99	-1.5145
40.01		160.01	-1.1118	280.01	-1.4888
44.94		164.94	-1.0729	284.94	-1.5180
49.95		169.95	-1.1260	289.95	-1.5406
54.90		174.90	-1.1404	294.90	-1.4151
59.99		179.99	-1.1286	299.99	-1.3054
60.01	-1.2684	180.01	-1.0786	300.01	-1.3743
64.94	-1.3917	184.94	-1.0770	304.94	-1.1153
69.95	-1.5057	189.95	-1.0641	309.95	-0.9169
74.90	-1.5239	194.90	-1.0605	314.90	-0.6426
79.99	-1.4754	199.99	-1.0934	319.99	-0.3850
80.01	-1.5054	200.01	-1.0848	320.01	-0.3624
84.94	-1.2976	204.94	-1.0627	324.94	-0.0813
89.95	-1.1648	209.95	-1.0621	329.95	0.1701
94.90	-1.0564	214.90	-1.0359	334.90	0.4119
99.99	-1.0238	219.99	-1.0251	339.99	0.6185
100.01		220.01	-1.0662	340.01	0.5854
104.94		224.94	-1.0627	344.94	0.7650
109.95		229.95	-1.0559	349.95	0.9023
114.90		234.90	-1.0236	354.90	0.9831
119.99		239.99	-1.0375	359.99	1.0158

CP   VS.   X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	136: 1	0.9993		1.0034	1.0055	1.0034	1.0013		0.9931
8.94	136: 2	0.9446		0.9466	0.9487	0.9466	0.9466		0.9485
13.95	136: 3	0.8342		0.8363	0.8445	0.8322	0.8322		0.8466
18.90	136: 4	0.6862		0.6862	0.6903	0.6821	0.6883		0.7210
23.99	136: 5	0.4824		0.4844	0.4906	0.4762	0.4927		0.5399
64.01	136: 1	-1.3305	-1.4299	-1.3305	-1.3346	-1.3326	-1.2621	-1.2526	
68.94	136: 2	-1.3876	-1.4998	-1.3673	-1.3591	-1.3550	-1.3469	-1.3629	
73.95	136: 3	-1.4397	-1.5531	-1.4252	-1.4355	-1.4170	-1.4314	-1.4188	
78.90	136: 4	-1.3969	-1.5280	-1.4112	-1.3764	-1.3867	-1.3826	-1.4356	
83.99	136: 5	-1.2623	-1.4237	-1.3388	-1.2850	-1.3223	-1.2395	-1.3261	
124.01	136: 1			-1.0032	-1.0197	-1.0320	-0.9764	-0.9833	-0.9895
128.94	136: 2			-0.9886	-1.0008	-0.9846	-0.9683	-1.0057	-0.9812
133.95	136: 3			-1.0185	-1.0329	-1.0288	-1.0575	-1.0270	-1.0002
138.90	136: 4			-1.0205	-1.0082	-1.0368	-1.0286	-1.0338	-0.9826
143.99	136: 5			-1.0668	-1.0194	-1.0792	-1.0009	-1.0541	-0.9713

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 2.064 E+6   K/D = 0.0100   MACH NO. = 0.203
CD   = 1.068   CL = -0.040   RUN ID   = 137

THETA	CP	THETA	CP	THETA	CP
0.00	1.0078	120.00	-0.9958	240.00	-1.0082
4.96	0.9882	124.96	-1.0200	244.96	-1.0078
9.92	0.9166	129.92	-1.0462	249.92	-0.9953
14.88	0.7995	134.88	-1.0214	254.88	-0.9642
19.97	0.6246	139.97	-1.0629	259.97	-0.9990
20.00	0.6640	140.00	-1.0063	260.00	-0.9908
24.96	0.4708	144.96	-0.9930	264.96	-1.0494
29.92	0.2412	149.92	-1.0901	269.92	-1.1548
34.88	-0.0113	154.88	-1.0375	274.88	-1.3085
39.97	-0.2873	159.97	-1.1017	279.97	-1.4539
40.00		160.00	-1.0499	280.00	-1.4727
44.96		164.96	-1.0373	284.96	-1.5551
49.92		169.92	-1.1408	289.92	-1.5128
54.88		174.88	-1.1236	294.88	-1.3845
59.97		179.97	-1.1023	299.97	-1.2818
60.00	-1.2284	180.00	-1.0450	300.00	-1.3053
64.96	-1.3895	184.96	-1.1157	304.96	-1.1280
69.92	-1.4917	189.92	-1.1384	309.92	-0.9297
74.88	-1.4828	194.88	-1.1089	314.88	-0.6361
79.97	-1.5120	199.97	-1.2080	319.97	-0.3659
80.00	-1.4112	200.00	-1.0941	320.00	-0.3452
84.96	-1.2802	204.96	-1.1035	324.96	-0.0907
89.92	-1.1622	209.92	-1.0890	329.92	0.1722
94.88	-1.0606	214.88	-1.0476	334.88	0.4150
99.97	-1.0137	219.97	-1.0654	339.97	0.6195
100.00		220.00	-1.0107	340.00	0.5854
104.96		224.96	-1.2432	344.96	0.7651
109.92		229.92	-1.0915	349.92	0.8993
114.88		234.88	-1.0402	354.88	0.9907
119.97		239.97	-1.0654	359.97	1.0151

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	137: 1	1.0004		1.0028	1.0004	0.9979	0.9979		0.9906
8.96	137: 2	0.9416		0.9441	0.9465	0.9416	0.9441		0.9441
13.92	137: 3	0.8378		0.8378	0.8402	0.8329	0.8402		0.8500
18.88	137: 4	0.6916		0.6940	0.6990	0.6891	0.6916		0.7188
23.97	137: 5	0.4944		0.4944	0.4944	0.4870	0.4944		0.5531
64.00	137: 1	-1.2850	-1.3808	-1.3022	-1.2899	-1.2481	-1.2579	-1.2662	
68.96	137: 2	-1.3723	-1.5169	-1.3968	-1.3674	-1.3576	-1.3797	-1.3195	
73.92	137: 3	-1.4005	-1.5459	-1.4424	-1.4350	-1.4473	-1.3881	-1.4560	
78.88	137: 4	-1.3849	-1.5318	-1.4339	-1.4314	-1.3163	-1.3775	-1.3649	
83.97	137: 5	-1.2416	-1.3669	-1.2514	-1.2735	-1.2440	-1.2317	-1.2572	
124.00	137: 1			-0.9721	-0.9941	-0.9428	-0.9697	-0.9615	-0.9787
128.96	137: 2			-1.0003	-1.0125	-1.0174	-1.0198	-0.9196	-0.9784
133.92	137: 3			-1.0263	-1.0705	-1.0263	-0.9871	-1.0397	-1.0027
138.88	137: 4			-1.0595	-1.0522	-1.0034	-0.9985	-0.9863	-1.0231
143.97	137: 5			-1.0332	-1.0454	-1.0259	-1.0014	-0.9916	-0.9645

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 1.537 E+6   K/D = 0.0100   MACH NO. = 0.198
CD = 1.036   CL = -0.025   RUN ID = 139

THETA	CP	THETA	CP	THETA	CP
-0.02	1.0166	119.98	-0.9668	239.98	-0.9529
4.94	0.9856	124.94	-0.9470	244.94	-0.9740
9.90	0.9199	129.90	-1.0286	249.90	-0.9793
14.86	0.7998	134.86	-1.0127	254.86	-0.9628
19.97	0.6315	139.97	-1.0396	259.97	-0.9828
19.98	0.6738	139.98	-1.0118	259.98	-0.9598
24.94	0.4736	144.94	-0.9665	264.94	-0.9955
29.90	0.2241	149.90	-1.0216	269.90	-1.0633
34.86	-0.0245	154.86	-1.1005	274.86	-1.1925
39.97	-0.2854	159.97	-1.0969	279.97	-1.3674
39.98		159.98	-0.9980	279.98	-1.3655
44.94		164.94	-1.0224	284.94	-1.4562
49.90		169.90	-1.0694	289.90	-1.4585
54.86		174.86	-1.0319	294.86	-1.3758
59.97		179.97	-1.1069	299.97	-1.2466
59.98	-1.2173	179.98	-0.9841	299.98	-1.2761
64.94	-1.3158	184.94	-0.9947	304.94	-1.1038
69.90	-1.4323	189.90	-1.0729	309.90	-0.8904
74.86	-1.5115	194.86	-1.1010	314.86	-0.6486
79.97	-1.4773	199.97	-1.0656	319.97	-0.3612
79.98	-1.3517	199.98	-1.0812	319.98	-0.3306
84.94	-1.1756	204.94	-1.0259	324.94	-0.0695
89.90	-1.0910	209.90	-1.0971	329.90	0.1687
94.86	-1.0404	214.86	-1.0353	334.86	0.3996
99.97	-0.9913	219.97	-1.0449	339.97	0.6171
99.98		219.98	-1.0223	339.98	0.6010
104.94		224.94	-1.0467	344.94	0.7677
109.90		229.90	-1.0451	349.90	0.8886
114.86		234.86	-1.0526	354.86	0.9720
119.97		239.97	-1.0380	359.97	1.0098

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.98	139: 1	1.0097		1.0166	1.0166	1.0132	1.0097		1.0028
8.94	139: 2	0.9442		0.9442	0.9477	0.9408	0.9408		0.9372
13.90	139: 3	0.8369		0.8334	0.8404	0.8300	0.8334		0.8436
18.86	139: 4	0.6862		0.6896	0.6896	0.6862	0.6862		0.7030
23.97	139: 5	0.4939		0.4939	0.5008	0.4905	0.4939		0.5517
63.98	139: 1	-1.2484	-1.3385	-1.2761	-1.2761	-1.2588	-1.2346	-1.1956	
68.94	139: 2	-1.3054	-1.4265	-1.3608	-1.3192	-1.3262	-1.3019	-1.2726	
73.90	139: 3	-1.3388	-1.5223	-1.4600	-1.4219	-1.3907	-1.3803	-1.3961	
78.86	139: 4	-1.3632	-1.5115	-1.4253	-1.4253	-1.3770	-1.4426	-1.3827	
83.97	139: 5	-1.1879	-1.3636	-1.2568	-1.2224	-1.2637	-1.2568	-1.2777	
123.98	139: 1			-0.9635	-0.9911	-0.9704	-0.9601	-0.9460	-0.9286
128.94	139: 2			-0.9837	-0.9802	-0.9699	-0.9837	-0.8874	-0.9116
133.90	139: 3			-1.0423	-1.0458	-0.9871	-0.9906	-0.9793	-0.9516
138.86	139: 4			-1.0249	-1.0730	-0.9974	-1.0592	-1.0008	-1.0008
143.97	139: 5			-1.0420	-1.0318	-1.0283	-1.0112	-1.0242	-0.9656

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 1.287 E+6	K/D = 0.0100	MACH NO. = 0.197
CD = 1.061	CL = -0.035	RUN ID = 140

THETA	CP	THETA	CP	THETA	CP
0.00	1.0179	120.00	-0.9977	240.00	-1.0453
4.94	1.0016	124.94	-0.9827	244.94	-1.0220
9.92	0.9237	129.92	-1.0176	249.92	-1.0160
14.88	0.8051	134.88	-1.0417	254.88	-1.0195
19.93	0.6254	139.93	-1.0502	259.93	-1.0378
20.00	0.6571	140.00	-0.9961	260.00	-1.0223
24.94	0.4736	144.94	-1.0219	264.94	-1.0359
29.92	0.2309	149.92	-1.1008	269.92	-1.0423
34.88	-0.0184	154.88	-1.0554	274.88	-1.2345
39.93	-0.2971	159.93	-1.1201	279.93	-1.4318
40.00		160.00	-1.0986	280.00	-1.4369
44.94		164.94	-1.0630	284.94	-1.5320
49.92		169.92	-1.1144	289.92	-1.5019
54.88		174.88	-1.1056	294.88	-1.4356
59.93		179.93	-1.1279	299.93	-1.3087
60.00	-1.2422	180.00	-1.1355	300.00	-1.3315
64.94	-1.3916	184.94	-1.0425	304.94	-1.1472
69.92	-1.4619	189.92	-1.1144	309.92	-0.8963
74.88	-1.4951	194.88	-1.1384	314.88	-0.6492
79.93	-1.4575	199.93	-1.1770	319.93	-0.3873
80.00	-1.4369	200.00	-1.0986	320.00	-0.3638
84.94	-1.2573	204.94	-1.0548	324.94	-0.0913
89.92	-1.1243	209.92	-1.0816	329.92	0.1694
94.88	-1.0294	214.88	-1.0769	334.88	0.4076
99.93	-1.0214	219.93	-1.1074	339.93	0.6164
100.00		220.00	-1.1355	340.00	0.5792
104.94		224.94	-1.0875	344.94	0.7683
109.92		229.92	-1.0570	349.92	0.9072
114.88		234.88	-1.0277	354.88	0.9851
119.93		239.93	-1.0419	359.93	1.0220

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	140: 1	1.0015		1.0015	1.0015	0.9975	0.9934		0.9933
8.94	140: 2	0.9566		0.9607	0.9607	0.9566	0.9566		0.9442
13.92	140: 3	0.8501		0.8460	0.8582	0.8460	0.8541		0.8540
18.88	140: 4	0.6947		0.6906	0.6947	0.6906	0.6947		0.7148
23.93	140: 5	0.4864		0.4864	0.4946	0.4905	0.5027		0.5468
64.00	140: 1	-1.2750	-1.4267	-1.3488	-1.3406	-1.3078	-1.2832	-1.2686	
68.94	140: 2	-1.3425	-1.4736	-1.4080	-1.3752	-1.3425	-1.3957	-1.3598	
73.92	140: 3	-1.4087	-1.5316	-1.4415	-1.4169	-1.4169	-1.3759	-1.4444	
78.88	140: 4	-1.3803	-1.5115	-1.4377	-1.4336	-1.3844	-1.3885	-1.3945	
83.93	140: 5	-1.2034	-1.3427	-1.3960	-1.2731	-1.2772	-1.2444	-1.2348	
124.00	140: 1			-1.0288	-1.0655	-1.0369	-1.0124	-0.9796	-0.9591
128.94	140: 2			-1.0178	-1.0260	-1.0056	-1.0505	-0.9974	-0.9401
133.92	140: 3			-1.0600	-1.0478	-1.0355	-0.9988	-1.0693	-0.9668
138.88	140: 4			-1.0840	-1.0676	-1.0513	-1.0676	-1.0482	-0.9867
143.93	140: 5			-1.1324	-1.0956	-1.0875	-1.0426	-1.0296	-0.9682

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 0.415 E+6   K/D = 0.0100   MACH NO. = 0.196
CD = 1.128   CL = -0.024   RUN ID = 142

THETA	CP	THETA	CP	THETA	CP
-0.01	0.9550	119.99	-1.2825	239.99	-1.2204
4.92	0.9298	124.92	-1.2063	244.92	-1.2555
9.91	0.8366	129.91	-1.2852	249.91	-1.2122
14.86	0.7036	134.86	-1.3394	254.86	-1.2253
19.93	0.5987	139.93	-1.2117	259.93	-1.1780
19.99	0.5988	139.99	-1.2374	259.99	-1.2825
24.92	0.3425	144.92	-1.2991	264.92	-1.3131
29.91	0.0899	149.91	-1.3222	269.91	-1.4052
34.86	-0.1894	154.86	-1.2822	274.86	-1.6330
39.93	-0.4522	159.93	-1.2766	279.93	-1.7172
39.99		159.99	-1.2751	279.99	-1.8041
44.92		164.92	-1.3221	284.92	-1.8738
49.91		169.91	-1.3186	289.91	-1.8455
54.86		174.86	-1.3717	294.86	-1.7798
59.93		179.93	-1.2840	299.93	-1.5576
59.99	-1.5958	179.99	-1.2751	299.99	-1.6196
64.92	-1.7511	184.92	-1.3088	304.92	-1.4455
69.91	-1.8695	189.91	-1.4251	309.91	-1.2030
74.86	-1.8826	194.86	-1.3583	314.86	-0.8954
79.93	-1.7665	199.93	-1.3238	319.93	-0.5187
79.99	-1.7629	199.99	-1.3162	319.99	-0.5378
84.92	-1.6068	204.92	-1.3088	324.92	-0.2713
89.91	-1.4186	209.91	-1.3319	329.91	0.0099
94.86	-1.3394	214.86	-1.3184	334.86	0.3035
99.93	-1.2117	219.93	-1.1912	339.93	0.5843
99.99		219.99	-1.2477	339.99	0.5030
104.92		224.92	-1.3355	344.92	0.6895
109.91		229.91	-1.2920	349.91	0.8363
114.86		234.86	-1.2918	354.86	0.9296
119.93		239.93	-1.2708	359.93	1.0095

CP VS. X/D

THETA	RUN:SEQ	X/D=0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.99	142: 1	0.9413		0.9413	0.9276	0.9413	0.9276		0.9549
8.92	142: 2	0.8632		0.8632	0.8766	0.8632	0.8632		0.8763
13.91	142: 3	0.7435		0.7568	0.7568	0.7568	0.7568		0.7830
18.86	142: 4	0.5705		0.5705	0.5838	0.5705	0.5705		0.6365
23.93	142: 5	0.4397		0.4265	0.4265	0.4265	0.4265		0.4913
63.99	142: 1	-1.5958	-1.7741	-1.6644	-1.6644	-1.6507	-1.5821	-1.5433	
68.92	142: 2	-1.7244	-1.8978	-1.7644	-1.6711	-1.7511	-1.7378	-1.6736	
73.91	142: 3	-1.7629	-1.9228	-1.8162	-1.8162	-1.7762	-1.7495	-1.7121	
78.86	142: 4	-1.7359	-1.9092	-1.7759	-1.7493	-1.6960	-1.7359	-1.7131	
83.93	142: 5	-1.5008	-1.7001	-1.5672	-1.5540	-1.5540	-1.5672	-1.5044	
123.99	142: 1			-1.2510	-1.2646	-1.2510	-1.2510	-1.1930	-1.1657
128.92	142: 2			-1.2726	-1.2062	-1.2991	-1.3257	-1.2022	-1.2155
133.91	142: 3			-1.3222	-1.3089	-1.2162	-1.2427	-1.2654	-1.2255
138.86	142: 4			-1.3087	-1.3617	-1.3087	-1.2955	-1.2785	-1.3051
143.93	142: 5			-1.3294	-1.2502	-1.3030	-1.2766	-1.1647	-1.2045

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 0.514 E+6   K/D = 0.0100   MACH NO. = 0.197
CD = 1.142   CL = -0.024   RUN ID = 143

THETA	CP	THETA	CP	THETA	CP
0.01	0.9568	120.01	-1.2441	240.01	-1.2377
4.92	0.9462	124.92	-1.2649	244.92	-1.2054
9.88	0.8721	129.88	-1.2421	249.88	-1.2241
14.84	0.7455	134.84	-1.3244	254.84	-1.2129
19.97	0.5756	139.97	-1.3062	259.97	-1.2911
20.01	0.5853	140.01	-1.2798	260.01	-1.2441
24.92	0.3841	144.92	-1.2804	264.92	-1.3074
29.88	0.1293	149.88	-1.3105	269.88	-1.4015
34.84	-0.1557	154.84	-1.3604	274.84	-1.5790
39.97	-0.4775	159.97	-1.3845	279.97	-1.7205
40.01		160.01	-1.2695	280.01	-1.7650
44.92		164.92	-1.2690	284.92	-1.8495
49.88		169.88	-1.3405	289.88	-1.8582
54.84		174.84	-1.2870	294.84	-1.7381
59.97		179.97	-1.3547	299.97	-1.6248
60.01	-1.5581	180.01	-1.3331	300.01	-1.6006
64.92	-1.7287	184.92	-1.2478	304.92	-1.3973
69.88	-1.8236	189.88	-1.2664	309.88	-1.1647
74.84	-1.8945	194.84	-1.4034	314.84	-0.8549
79.97	-1.8134	199.97	-1.3441	319.97	-0.5731
80.01	-1.7544	200.01	-1.3225	320.01	-0.5288
84.92	-1.5625	204.92	-1.3220	324.92	-0.2309
89.88	-1.4333	209.88	-1.2558	329.88	0.0445
94.84	-1.2713	214.84	-1.3188	334.84	0.3105
99.97	-1.2212	219.97	-1.2911	339.97	0.5529
100.01		220.01	-1.2695	340.01	0.5323
104.92		224.92	-1.3856	344.92	0.7234
109.88		229.88	-1.2770	349.88	0.8612
114.84		234.84	-1.2976	354.84	0.9249
119.97		239.97	-1.2699	359.97	0.9779

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	143: 1	0.9462		0.9462	0.9568	0.9462	0.9462		0.9461
8.92	143: 2	0.9145		0.9039	0.9039	0.9039	0.9039		0.9143
13.88	143: 3	0.7980		0.7980	0.7980	0.7875	0.7980		0.7869
18.84	143: 4	0.6187		0.6292	0.6398	0.6187	0.6398		0.6813
23.97	143: 5	0.3956		0.3956	0.4168	0.3956	0.4062		0.4467
64.01	143: 1	-1.5581	-1.7067	-1.6324	-1.6006	-1.5369	-1.5581	-1.5630	
68.92	143: 2	-1.7074	-1.8454	-1.7605	-1.7181	-1.7181	-1.6862	-1.6263	
73.88	143: 3	-1.7494	-1.9298	-1.7600	-1.7281	-1.7600	-1.7812	-1.6989	
78.84	143: 4	-1.6295	-1.8839	-1.7143	-1.7037	-1.6613	-1.7037	-1.6851	
83.97	143: 5	-1.5268	-1.6966	-1.5693	-1.5586	-1.4843	-1.5799	-1.4867	
124.01	143: 1			-1.2693	-1.2271	-1.1743	-1.2165	-1.2483	-1.2059
128.92	143: 2			-1.2699	-1.2804	-1.2804	-1.2804	-1.2160	-1.1736
133.88	143: 3			-1.2683	-1.2472	-1.3105	-1.3316	-1.2346	-1.2135
138.84	143: 4			-1.2867	-1.2761	-1.3182	-1.2656	-1.2553	-1.2129
143.97	143: 5			-1.3318	-1.3318	-1.3002	-1.3318	-1.2063	-1.2487

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 0.619 E+6	K/D = 0.0100	MACH NO. = 0.198	
CD = 1.149	CL = -0.013	RUN ID = 144	

THETA	CP	THETA	CP	THETA	CP
-0.01	0.9837	119.99	-1.2145	239.99	-1.2091
4.94	0.9662	124.94	-1.2526	244.94	-1.1914
9.89	0.8965	129.89	-1.2565	249.89	-1.2106
14.84	0.7482	134.84	-1.2738	254.84	-1.2344
19.93	0.5821	139.93	-1.3232	259.93	-1.2453
19.99	0.6257	139.99	-1.2516	259.99	-1.2232
24.94	0.3887	144.94	-1.2492	264.94	-1.2438
29.89	0.1365	149.89	-1.3257	269.89	-1.3352
34.84	-0.1615	154.84	-1.3180	274.84	-1.4663
39.93	-0.4783	159.93	-1.3213	279.93	-1.7003
39.99		159.99	-1.2615	279.99	-1.6874
44.94		164.94	-1.1914	284.94	-1.8138
49.89		169.89	-1.3242	289.89	-1.7727
54.84		174.84	-1.3217	294.84	-1.6938
59.93		179.93	-1.3501	299.93	-1.5775
59.99	-1.5348	179.99	-1.3139	299.99	-1.5572
64.94	-1.6932	184.94	-1.3049	304.94	-1.3521
69.89	-1.7935	189.89	-1.2980	309.89	-1.1036
74.84	-1.8208	194.84	-1.3217	314.84	-0.8520
79.93	-1.7563	199.93	-1.3851	319.93	-0.5483
79.99	-1.6786	199.99	-1.2964	319.99	-0.4920
84.94	-1.4192	204.94	-1.2875	324.94	-0.2149
89.89	-1.3440	209.89	-1.2980	329.89	0.0754
94.84	-1.2563	214.84	-1.2781	334.84	0.3280
99.93	-1.2706	219.93	-1.2977	339.93	0.5546
99.99		219.99	-1.2702	339.99	0.5558
104.94		224.94	-1.2525	344.94	0.7212
109.89		229.89	-1.3155	349.89	0.8701
114.84		234.84	-1.2693	354.84	0.9660
119.93		239.93	-1.2627	359.93	0.9923

				CP	VS.	X/D			
THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.99	144: 1	0.9663		0.9750	0.9750	0.9750	0.9750		0.9837
8.94	144: 2	0.9051		0.9051	0.9051	0.9226	0.9138		0.9224
13.89	144: 3	0.8007		0.8094	0.8094	0.8007	0.8094		0.8089
18.84	144: 4	0.6348		0.6174	0.6348	0.6261	0.6261		0.6689
23.93	144: 5	0.4250		0.4163	0.4163	0.4163	0.4250		0.4671
63.99	144: 1	-1.4998	-1.6659	-1.5697	-1.5523	-1.5523	-1.5085	-1.5122	
68.94	144: 2	-1.6407	-1.7282	-1.6932	-1.6582	-1.6582	-1.6407	-1.6297	
73.89	144: 3	-1.6887	-1.8022	-1.7149	-1.6887	-1.6887	-1.6451	-1.6852	
78.84	144: 4	-1.5850	-1.8034	-1.6723	-1.6461	-1.6461	-1.6461	-1.5888	
83.93	144: 5	-1.5112	-1.6425	-1.5374	-1.5549	-1.5112	-1.5024	-1.5337	
123.99	144: 1			-1.2081	-1.2081	-1.2429	-1.1820	-1.1828	-1.1566
128.94	144: 2			-1.2144	-1.2492	-1.2144	-1.2231	-1.2001	-1.1390
133.89	144: 3			-1.2389	-1.2389	-1.2563	-1.1955	-1.2892	-1.2455
138.84	144: 4			-1.2658	-1.2658	-1.3006	-1.2832	-1.2431	-1.2082
143.93	144: 5			-1.3300	-1.2778	-1.2691	-1.2256	-1.2715	-1.2190

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 0.727 E+6	K/D = 0.0100	MACH NO. = 0.199
CD = 1.157	CL = -0.015	RUN ID = 145

THETA	CP	THETA	CP	THETA	CP
0.00	0.9804	120.00	-1.2132	240.00	-1.2236
4.94	0.9877	124.94	-1.2067	244.94	-1.2012
9.90	0.8993	129.90	-1.1927	249.90	-1.1946
14.85	0.7661	134.85	-1.2530	254.85	-1.1733
19.97	0.5743	139.97	-1.2503	259.97	-1.2161
20.00	0.6107	140.00	-1.2628	260.00	-1.1984
24.94	0.4035	144.94	-1.2405	264.94	-1.2067
29.90	0.1596	149.90	-1.2622	269.90	-1.2965
34.85	-0.1298	154.85	-1.3208	274.85	-1.4162
39.97	-0.4020	159.97	-1.3277	279.97	-1.6726
40.00		160.00	-1.2236	280.00	-1.6949
44.94		164.94	-1.3195	284.94	-1.7553
49.90		169.90	-1.3129	289.90	-1.7786
54.85		174.85	-1.2695	294.85	-1.6684
59.97		179.97	-1.3271	299.97	-1.5393
60.00	-1.4886	180.00	-1.2827	300.00	-1.5033
64.94	-1.6153	184.94	-1.3343	304.94	-1.3195
69.90	-1.7494	189.90	-1.2833	309.90	-1.0678
74.85	-1.7935	194.85	-1.3435	314.85	-0.8032
79.97	-1.7176	199.97	-1.3566	319.97	-0.5128
80.00	-1.6430	200.00	-1.2975	320.00	-0.4685
84.94	-1.4810	204.94	-1.2677	324.94	-0.1881
89.90	-1.3336	209.90	-1.2167	329.90	0.0857
94.85	-1.2604	214.85	-1.3065	334.85	0.3438
99.97	-1.2058	219.97	-1.2531	339.97	0.5737
100.00		220.00	-1.1866	340.00	0.5442
104.94		224.94	-1.2603	344.94	0.7362
109.90		229.90	-1.1946	349.90	0.8768
114.85		234.85	-1.2473	354.85	0.9581
119.97		239.97	-1.2827	359.97	1.0098

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	145: 1	0.9730		0.9730	0.9730	0.9730	0.9656		0.9803
8.94	145: 2	0.9213		0.9213	0.9287	0.9213	0.9213		0.9285
13.90	145: 3	0.8181		0.8255	0.8255	0.8181	0.8181		0.8177
18.85	145: 4	0.6480		0.6480	0.6554	0.6480	0.6554		0.6769
23.97	145: 5	0.4341		0.4267	0.4341	0.4267	0.4341		0.4924
64.00	145: 1	-1.5033	-1.6364	-1.5255	-1.5403	-1.5033	-1.4738	-1.4504	
68.94	145: 2	-1.6227	-1.7410	-1.6818	-1.6301	-1.5709	-1.6079	-1.5996	
73.90	145: 3	-1.6680	-1.7864	-1.7420	-1.6384	-1.6902	-1.6384	-1.6154	
78.85	145: 4	-1.5642	-1.7565	-1.6529	-1.6012	-1.5420	-1.6160	-1.6239	
83.97	145: 5	-1.4885	-1.5846	-1.4885	-1.4959	-1.5107	-1.5033	-1.5096	
124.00	145: 1			-1.2261	-1.2187	-1.2261	-1.2261	-1.1274	-1.1644
128.94	145: 2			-1.2332	-1.2111	-1.1890	-1.2038	-1.2086	-1.1938
133.90	145: 3			-1.2402	-1.1961	-1.2328	-1.2034	-1.1650	-1.1502
138.85	145: 4			-1.2326	-1.2473	-1.2105	-1.1958	-1.2251	-1.1733
143.97	145: 5			-1.2616	-1.2910	-1.2763	-1.2175	-1.2309	-1.2309

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 0.822 E+6   K/D = 0.0100   MACH NO. = 0.198
CD = 1.136   CL = -0.036   RUN ID = 146

THETA	CP	THETA	CP	THETA	CP
0.02	0.9966	120.02	-1.2097	240.02	-1.1909
4.92	0.9835	124.92	-1.2238	244.92	-1.1983
9.94	0.9049	129.94	-1.2133	249.94	-1.2011
14.85		134.85		254.85	
19.94	0.5999	139.94	-1.2148	259.94	-1.1960
20.02	0.6152	140.02	-1.1917	260.02	-1.2097
24.92	0.3986	144.92	-1.2394	264.92	-1.2501
29.94	0.1499	149.94	-1.2301	269.94	-1.3120
34.85		154.85		274.85	
39.94	-0.4216	159.94	-1.3158	279.94	-1.6466
40.02		160.02	-1.1055	280.02	-1.6576
44.92		164.92	-1.2838	284.92	-1.7575
49.94		169.94	-1.2470	289.94	-1.7724
54.85		174.85		294.85	
59.94		179.94	-1.2744	299.94	-1.4896
60.02	-1.4484	180.02	-1.2895	300.02	-1.5351
64.92	-1.6373	184.92	-1.3364	304.92	-1.3495
69.94	-1.6996	189.94	-1.2470	309.94	-1.0775
74.85		194.85		314.85	
79.94	-1.6529	199.94	-1.3135	319.94	-0.5066
80.02	-1.6312	200.02	-1.3026	320.02	-0.4830
84.92	-1.4873	204.92	-1.2904	324.92	-0.1929
89.94	-1.3054	209.94	-1.2339	329.94	0.0908
94.85		214.85		334.85	
99.94	-1.1756	219.94	-1.1895	339.94	0.5653
100.02		220.02	-1.3026	340.02	0.5231
104.92		224.92	-1.2838	344.92	0.7272
109.94		229.94	-1.2339	349.94	0.8850
114.85		234.85		354.85	
119.94		239.94	-1.1830	359.94	0.9967

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	146: 1	0.9966		0.9835	0.9966	0.9900	0.9900		0.9637
8.92	146: 2	0.9310		0.9245	0.9245	0.9310	0.9245		0.9243
13.94	146: 3	0.8263		0.8197	0.8197	0.8197	0.8263		0.8390
18.85	146: 4								
23.94	146: 5	0.4438		0.4503	0.4568	0.4503	0.4503		0.4869
64.02	146: 1	-1.5010	-1.6324	-1.5535	-1.5470	-1.5010	-1.5010	-1.4732	
68.92	146: 2	-1.5913	-1.7490	-1.6701	-1.6504	-1.6110	-1.5979	-1.6125	
73.94	146: 3	-1.6144	-1.7587	-1.6800	-1.6537	-1.6472	-1.6537	-1.6408	
78.85	146: 4								
83.94	146: 5	-1.3788	-1.5354	-1.5028	-1.4310	-1.4440	-1.4962	-1.4700	
124.02	146: 1			-1.1721	-1.1917	-1.1656	-1.1786	-1.1909	-1.1187
128.92	146: 2			-1.2198	-1.2590	-1.2329	-1.2133	-1.2049	-1.1392
133.94	146: 3			-1.2432	-1.2236	-1.2040	-1.2628	-1.2208	-1.1880
138.85	146: 4								
143.94	146: 5			-1.2638	-1.2314	-1.1924	-1.2898	-1.2221	-1.1830

ROUGH CYLINDER (NO. 6 MESH SCREEN)

THETA	CP	THETA	CP	THETA	CP
-0.02	1.0046	119.98	-1.1716	239.98	-1.1492
4.93	0.9824	124.93	-1.1806	244.93	-1.1549
9.89	0.9104	129.89	-1.2207	249.89	-1.1483
14.88	0.7832	134.88	-1.1941	254.88	-1.1341
19.95	0.5850	139.95	-1.2167	259.95	-1.1601
19.98	0.6142	139.98	-1.1969	259.98	-1.1492
24.93	0.4091	144.93	-1.2201	264.93	-1.1806
29.89	0.1830	149.89	-1.2200	269.89	-1.2430
34.88	-0.0986	154.88	-1.2289	274.88	-1.4329
39.95	-0.3629	159.95	-1.2842	279.95	-1.5989
39.98		159.98	-1.2162	279.98	-1.5968
44.93		164.93	-1.2718	284.93	-1.6990
49.89		169.89	-1.2704	289.89	-1.6714
54.88		174.88	-1.2616	294.88	-1.5939
59.95		179.95	-1.2543	299.95	-1.4272
59.98	-1.4102	179.98	-1.2831	299.98	-1.4604
64.93	-1.5501	184.93	-1.2607	304.93	-1.2941
69.89	-1.6255	189.89	-1.2593	309.89	-1.0273
74.88	-1.6674	194.88	-1.3281	314.88	-0.7749
79.95	-1.6667	199.95	-1.2543	319.95	-0.4847
79.98	-1.6192	199.98	-1.2497	319.98	-0.4621
84.93	-1.4314	204.93	-1.2551	324.93	-0.1809
89.89	-1.2652	209.89	-1.2871	329.89	0.1108
94.88	-1.1941	214.88	-1.2172	334.88	0.3615
99.95	-1.1225	219.95	-1.2210	339.95	0.5784
99.98		219.98	-1.2162	339.98	0.5473
104.93		224.93	-1.1994	344.93	0.7375
109.89		229.89	-1.2149	349.89	0.8825
114.88		234.88	-1.2117	354.88	0.9713
119.95		239.95	-1.1768	359.95	0.9936

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.98	147: 1	0.9879		0.9935	0.9935	0.9935	0.9879		0.9823
8.93	147: 2	0.9380		0.9380	0.9380	0.9380	0.9380		0.9212
13.89	147: 3	0.8218		0.8273	0.8273	0.8218	0.8273		0.8326
18.88	147: 4	0.6504		0.6504	0.6559	0.6504	0.6504		0.6775
23.95	147: 5	0.4470		0.4470	0.4470	0.4359	0.4525		0.5064
63.98	147: 1	-1.4604	-1.5943	-1.5162	-1.4883	-1.4827	-1.4660	-1.4066	
68.93	147: 2	-1.5445	-1.7115	-1.5890	-1.5835	-1.5501	-1.5000	-1.5262	
73.89	147: 3	-1.5701	-1.7143	-1.6200	-1.6034	-1.5590	-1.5423	-1.5323	
78.88	147: 4	-1.5011	-1.7063	-1.6009	-1.5510	-1.5566	-1.5011	-1.5495	
83.95	147: 5	-1.3570	-1.4897	-1.4510	-1.4123	-1.3791	-1.3791	-1.3884	
123.98	147: 1			-1.1858	-1.1581	-1.1858	-1.1414	-1.1548	-1.1381
128.93	147: 2			-1.1814	-1.1758	-1.1426	-1.1205	-1.1438	-1.1271
133.89	147: 3			-1.2090	-1.1979	-1.1427	-1.1538	-1.1483	-1.1206
138.88	147: 4			-1.2179	-1.1903	-1.1903	-1.1517	-1.1341	-1.1231
143.95	147: 5			-1.2237	-1.1962	-1.2017	-1.1852	-1.1546	-1.1159

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 1.057 E+6   K/D = 0.0100   MACH NO. = 0.203
CD = 1.123   CL = -0.018   RUN ID = 148

THETA	CP	THETA	CP	THETA	CP
-0.01	1.0054	119.99	-1.1356	239.99	-1.1250
4.94	0.9857	124.94	-1.1194	244.94	-1.1456
9.92	0.9116	129.92	-1.1536	249.92	-1.1073
14.88	0.7839	134.88	-1.1720	254.88	-1.1377
19.97	0.6070	139.97	-1.1878	259.97	-1.1426
19.99	0.6253	139.99	-1.1579	259.99	-1.1306
24.94	0.4229	144.94	-1.2006	264.94	-1.1836
29.92	0.1748	149.92	-1.1894	269.92	-1.2279
34.88	-0.0914	154.88	-1.2271	274.88	-1.3996
39.97	-0.3854	159.97	-1.2292	279.97	-1.5632
39.99		159.99	-1.1989	279.99	-1.5608
44.94		164.94	-1.2344	284.94	-1.6975
49.92		169.92	-1.2504	289.92	-1.6141
54.88		174.88	-1.2562	294.88	-1.5827
59.97		179.97	-1.1475	299.97	-1.4348
59.99	-1.3765	179.99	-1.2581	299.99	-1.4481
64.94	-1.5524	184.94	-1.2541	304.94	-1.2603
69.92	-1.6467	189.92	-1.2060	309.92	-1.0167
74.88	-1.6823	194.88	-1.2266	314.88	-0.7535
79.97	-1.6106	199.97	-1.3150	319.97	-0.4643
79.99	-1.6152	199.99	-1.2285	319.99	-0.4460
84.94	-1.4060	204.94	-1.1752	324.94	-0.1645
89.92	-1.2626	209.92	-1.2356	329.92	0.1105
94.88	-1.1819	214.88	-1.1920	334.88	0.3582
99.97	-1.1681	219.97	-1.1968	339.97	0.5812
99.99		219.99	-1.1644	339.99	0.5512
104.94		224.94	-1.1949	344.94	0.7388
109.92		229.92	-1.1714	349.92	0.8768
114.88		234.88	-1.1328	354.88	0.9708
119.97		239.97	-1.1869	359.97	1.0004

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
3.99	148: 1	0.9906		0.9906	0.9955	1.0005	0.9955		0.9757
8.94	148: 2	0.9414		0.9365	0.9365	0.9316	0.9365		0.9214
13.92	148: 3	0.8278		0.8229	0.8328	0.8229	0.8278		0.8224
18.88	148: 4	0.6707		0.6707	0.6707	0.6658	0.6707		0.6892
23.97	148: 5	0.4496		0.4594	0.4594	0.4545	0.4594		0.5072
63.99	148: 1	-1.4356	-1.5638	-1.4948	-1.4553	-1.4307	-1.4208	-1.3927	
68.94	148: 2	-1.5129	-1.6558	-1.5671	-1.4637	-1.5573	-1.5031	-1.4801	
73.92	148: 3	-1.5627	-1.6961	-1.5924	-1.5776	-1.5874	-1.5331	-1.5349	
78.88	148: 4	-1.5094	-1.7070	-1.5588	-1.5736	-1.5094	-1.5489	-1.5085	
83.97	148: 5	-1.3544	-1.4825	-1.4332	-1.3840	-1.3692	-1.4234	-1.4002	
123.99	148: 1			-1.1284	-1.1186	-1.0892	-1.1088	-1.1102	-1.0559
128.94	148: 2			-1.1516	-1.1026	-1.1614	-1.1320	-1.1061	-1.0864
133.92	148: 3			-1.1354	-1.1698	-1.1207	-1.1108	-1.0925	-1.0925
138.88	148: 4			-1.1535	-1.1732	-1.1241	-1.1634	-1.1229	-1.1328
143.97	148: 5			-1.1949	-1.1802	-1.1606	-1.1606	-1.1327	-1.1475

ROUGH CYLINDER (NO. 6 MESH SCREEN)

<pre>
REY NO. = 2.127 E+6   K/D = 0.0100   MACH NO. = 0.060
      CD = 1.004   CL   = -0.030   RUN ID   = 152
</pre>

THETA	CP	THETA	CP	THETA	CP
0.01	1.0001	120.01	-0.9754	240.01	-0.9911
4.89	0.9689	124.89	-0.9463	244.89	-0.9201
9.89	0.9186	129.89	-0.9675	249.89	-0.9497
14.84	0.8048	134.84	-0.9953	254.84	-1.0027
19.92	0.6185	139.92	-0.9765	259.92	-1.0319
20.01	0.6493	140.01	-1.0189	260.01	-0.9590
24.89	0.4565	144.89	-1.0525	264.89	-1.0343
29.89	0.2251	149.89	-0.9393	269.89	-1.1307
34.84	-0.0175	154.84	-1.0310	274.84	-1.2233
39.92	-0.3086	159.92	-0.9983	279.92	-1.5052
40.01		160.01	-1.0563	280.01	-1.4570
44.89		164.89	-1.1042	284.89	-1.5151
49.89		169.89	-1.0312	289.89	-1.4573
54.84		174.84	-1.2063	294.84	-1.4187
59.92		179.92	-1.0889	299.92	-1.3017
60.01	-1.2498	180.01	-0.9666	300.01	-1.3492
64.89	-1.3834	184.89	-1.0321	304.89	-1.1363
69.89	-1.4319	189.89	-1.1047	309.89	-0.9088
74.84	-1.4666	194.84	-1.0027	314.84	-0.6603
79.92	-1.3822	199.92	-1.0157	319.92	-0.4224
80.01	-1.4570	200.01	-1.0237	320.01	-0.3541
84.89	-1.3068	204.89	-0.9761	324.89	-0.1037
89.89	-1.0491	209.89	-1.0150	329.89	0.1679
94.84	-1.0034	214.84	-0.9865	334.84	0.3975
99.92	-0.9765	219.92	-1.0238	339.92	0.5935
100.01		220.01	-0.9992	340.01	0.5596
104.89		224.89	-1.0402	344.89	0.7448
109.89		229.89	-0.9905	349.89	0.8858
114.84		234.84	-0.9538	354.84	0.9834
119.92		239.92	-0.9751	359.92	1.0079

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	152: 1	1.0001		0.9920	0.9920	1.0001	1.0001		0.9757
8.89	152: 2	0.9290		0.9210	0.9290	0.9290	0.9210		0.9209
13.89	152: 3	0.8371		0.8371	0.8371	0.8371	0.8290		0.8451
18.84	152: 4	0.6830		0.6830	0.6910	0.6830	0.6910		0.7066
23.92	152: 5	0.4806		0.4806	0.4806	0.4725	0.4725		0.5365
64.01	152: 1	-1.2742	-1.3720	-1.2905	-1.2905	-1.2987	-1.2334	-1.2366	
68.89	152: 2	-1.3435	-1.4956	-1.3834	-1.3515	-1.3675	-1.3195	-1.3950	
73.89	152: 3	-1.3257	-1.5135	-1.4319	-1.4074	-1.4155	-1.3502	-1.3102	
78.84	152: 4	-1.2958	-1.5074	-1.3121	-1.4585	-1.3691	-1.4097	-1.3780	
83.92	152: 5	-1.2440	-1.3661	-1.2929	-1.2359	-1.2766	-1.3742	-1.2530	
124.01	152: 1			-0.9378	-0.9864	-1.0351	-0.9783	-0.9420	-0.9828
128.89	152: 2			-1.0286	-0.9729	-1.0126	-0.9888	-0.9841	-0.9441
133.89	152: 3			-1.0204	-0.9962	-1.0204	-0.9880	-0.8436	-0.9416
138.84	152: 4			-0.9745	-1.0148	-0.9664	-1.0634	-1.0108	-0.9538
143.92	152: 5			-1.0064	-1.0307	-1.0388	-1.0953	-0.9832	-0.9101

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 3.515 E+6	K/D = 0.0100	MACH NO. = 0.100
CD = 0.993	CL = -0.035	RUN ID = 153

THETA	CP	THETA	CP	THETA	CP
0.01	0.9995	120.01	-0.9662	240.01	-0.9278
4.92	0.9817	124.92	-0.9907	244.92	-1.0033
9.90	0.9166	129.90	-0.9317	249.90	-0.9229
14.88	0.7865	134.88	-0.9517	254.88	-0.9556
19.97	0.6237	139.97	-0.9885	259.97	-0.9730
20.01	0.6483	140.01	-0.9889	260.01	-0.9662
24.92	0.4533	144.92	-0.9750	264.92	-1.0263
29.90	0.2374	149.90	-1.0134	269.90	-1.0500
34.88	-0.0166	154.88	-0.9864	274.88	-1.3105
39.97	-0.2844	159.97	-1.0525	279.97	-1.4010
40.01		160.01	-0.9662	280.01	-1.4421
44.92		164.92	-0.9587	284.92	-1.5402
49.90		169.90	-0.9643	289.90	-1.4906
54.88		174.88	-1.0029	294.88	-1.3994
59.97		179.97	-1.0649	299.97	-1.2526
60.01	-1.2218	180.01	-1.0963	300.01	-1.3058
64.92	-1.3582	184.92	-1.0419	304.92	-1.1317
69.90	-1.4386	189.90	-1.0648	309.90	-0.8876
74.88	-1.4756	194.88	-1.1244	314.88	-0.6416
79.97	-1.4226	199.97	-0.9463	319.97	-0.3674
80.01	-1.4214	200.01	-1.0638	320.01	-0.3613
84.92	-1.2640	204.92	-1.0657	324.92	-0.0988
89.90	-1.0914	209.90	-1.0116	329.90	0.1636
94.88	-0.9695	214.88	-0.9852	334.88	0.4010
99.97	-0.9648	219.97	-1.0026	339.97	0.611i
100.01		220.01	-0.9722	340.01	0.5686
104.92		224.92	-0.9736	344.92	0.7472
109.90		229.90	-0.9377	349.90	0.8930
114.88		234.88	-0.9822	354.88	0.9726
119.97		239.97	-0.9226	359.97	1.0054

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	153: 1	0.9877		0.9907	0.9936	0.9907	0.9936		0.9730
8.92	153: 2	0.9372		0.9402	0.9402	0.9372	0.9342		0.9193
13.90	153: 3	0.8370		0.8370	0.8399	0.8340	0.8399		0.8368
18.88	153: 4	0.6801		0.6831	0.6890	0.6772	0.6831		0.7031
23.97	153: 5	0.4876		0.4965	0.4936	0.4758	0.4876		0.5310
64.01	153: 1	-1.2691	-1.3754	-1.3252	-1.2809	-1.3016	-1.2484	-1.2470	
68.92	153: 2	-1.2988	-1.4621	-1.3760	-1.4027	-1.3463	-1.3492	-1.3323	
73.90	153: 3	-1.4031	-1.4889	-1.3973	-1.3618	-1.3440	-1.3440	-1.3487	
78.88	153: 4	-1.3600	-1.4252	-1.4371	-1.3097	-1.3867	-1.4164	-1.3994	
83.97	153: 5	-1.2178	-1.3692	-1.2356	-1.2534	-1.2356	-1.2089	-1.2496	
124.01	153: 1			-0.9860	-0.9860	-0.9801	-0.9213	-0.9544	-0.9308
128.92	153: 2			-0.9632	-1.0222	-0.9484	-0.9986	-0.9617	-0.9468
133.90	153: 3			-1.0046	-0.9634	-0.9311	-0.9194	-0.9258	-0.9731
138.88	153: 4			-1.0747	-0.9510	-0.9569	-1.0276	-0.9822	-0.8845
143.97	153: 5			-0.9581	-1.0082	-0.9640	-0.9316	-0.9997	-0.9463

ROUGH CYLINDER   (NO. 6 MESH SCREEN)

REY NO. = 4.209 E+6   K/D = 0.0100   MACH NO. = 0.120
CD = 1.001   CL = -0.031   RUN ID = 154

THETA	CP	THETA	CP	THETA	CP
0.00	1.0054	120.00	-0.9655	240.00	-0.9126
4.97	0.9830	124.97	-1.0067	244.97	-1.0116
9.91	0.9064	129.91	-0.9920	249.91	-0.9748
14.84	0.7925	134.84	-1.0119	254.84	-0.9620
19.92	0.6223	139.92	-0.9717	259.92	-0.9834
20.00	0.6534	140.00	-0.9914	260.00	-0.9777
24.97	0.4490	144.97	-0.9912	264.97	-1.0294
29.91	0.2228	149.91	-1.0286	269.91	-1.1511
34.84	-0.0192	154.84	-1.0399	274.84	-1.3506
39.92	-0.2982	159.92	-1.0244	279.92	-1.4486
40.00		160.00	-1.0347	280.00	-1.4500
44.97		164.97	-1.0405	284.97	-1.5619
49.91		169.91	-1.0286	289.91	-1.5166
54.84		174.84	-1.0010	294.84	-1.4101
59.92		179.92	-1.0100	299.92	-1.2842
60.00	-1.2204	180.00	-1.0164	300.00	-1.2794
64.97	-1.3881	184.97	-1.0488	304.97	-1.1324
69.91	-1.4874	189.91	-1.0162	309.91	-0.9232
74.84	-1.4998	194.84	-1.0112	314.84	-0.6668
79.92	-1.4580	199.92	-1.0450	319.92	-0.3762
80.00	-1.4725	200.00	-1.0103	320.00	-0.3334
84.97	-1.3019	204.97	-1.1024	324.97	-0.0912
89.91	-1.1511	209.91	-1.0017	329.91	0.1547
94.84	-1.0325	214.84	-1.0235	334.84	0.3989
99.92	-1.0005	219.92	-0.9834	339.92	0.6073
100.00		220.00	-0.9981	340.00	0.5781
104.97		224.97	-0.9785	344.97	0.7500
109.91		229.91	-0.9976	349.91	0.8856
114.84		234.84	-1.0995	354.84	0.9728
119.92		239.92	-0.9566	359.92	1.0118

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	154: 1	0.9972		0.9972	0.9972	0.9972	0.9932		0.9789
8.97	154: 2	0.9377		0.9398	0.9398	0.9356	0.9356		0.9458
13.91	154: 3	0.8280		0.8301	0.8342	0.8239	0.8321		0.8464
18.84	154: 4	0.6778		0.6860	0.6901	0.6778	0.6860		0.7023
23.92	154: 5	0.4871		0.4953	0.4973	0.4850	0.4912		0.5375
64.00	154: 1	-1.2469	-1.3812	-1.3283	-1.2978	-1.2550	-1.2530	-1.2424	
68.97	154: 2	-1.4025	-1.4891	-1.4293	-1.4046	-1.4211	-1.3427	-1.3246	
73.91	154: 3	-1.4048	-1.5371	-1.4482	-1.3986	-1.4461	-1.4254	-1.4175	
78.84	154: 4	-1.3932	-1.5203	-1.4342	-1.4096	-1.4116	-1.3645	-1.3424	
83.92	154: 5	-1.2114	-1.4169	-1.2319	-1.1908	-1.2299	-1.3162	-1.3047	
124.00	154: 1			-0.9792	-0.9853	-0.9813	-1.0035	-0.9512	-0.9431
128.97	154: 2			-0.9973	-1.0280	-1.0301	-1.0116	-0.9538	-0.9703
133.91	154: 3			-1.0102	-1.0266	-1.0245	-1.0040	-1.0162	-0.9542
138.84	154: 4			-0.9909	-1.0500	-1.0603	-0.9665	-0.9497	-0.9353
143.92	154: 5			-0.9775	-0.9448	-0.9530	-1.0020	-0.9834	-0.9032

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 5.218 E+6   K/D = 0.0100   MACH NO. = 0.150
CD = 1.018   CL = -0.025   RUN ID = 155

THETA	CP	THETA	CP	THETA	CP
0.00	1.0068	120.00	-0.9929	240.00	-1.0081
4.94	0.9847	124.94	-0.9784	244.94	-0.9835
9.93	0.9118	129.93	-0.9959	249.93	-0.9629
14.85	0.7888	134.85	-1.0150	254.85	-0.9904
19.96	0.6275	139.96	-1.0292	259.96	-1.0424
20.00	0.6563	140.00	-0.9979	260.00	-1.0035
24.94	0.4569	144.94	-0.9990	264.94	-1.0112
29.93	0.2287	149.93	-1.0162	269.93	-1.1440
34.85	-0.0255	154.85	-1.0911	274.85	-1.3264
39.96	-0.2901	159.96	-1.0202	279.96	-1.4789
40.00		160.00	-0.9910	280.00	-1.4714
44.94		164.94	-0.9914	284.94	-1.5160
49.93		169.93	-1.1189	289.93	-1.4996
54.85		174.85	-1.0870	294.85	-1.4257
59.96		179.96	-1.0765	299.96	-1.2888
60.00	-1.2080	180.00	-1.0622	300.00	-1.3177
64.94	-1.3369	184.94	-1.0556	304.94	-1.1065
69.93	-1.4652	189.93	-1.0330	309.93	-0.9073
74.85	-1.5304	194.85	-1.0340	314.85	-0.6595
79.96	-1.4924	199.96	-1.0568	319.96	-0.3700
80.00	-1.4358	200.00	-1.0543	320.00	-0.3412
84.94	-1.3154	204.94	-1.0543	324.94	-0.0812
89.93	-1.1903	209.93	-1.0369	329.93	0.1613
94.85	-1.0587	214.85	-1.0314	334.85	0.3900
99.96	-0.9964	219.96	-1.0083	339.96	0.6074
100.00		220.00	-1.0477	340.00	0.5772
104.94		224.94	-0.9573	344.94	0.7503
109.93		229.93	-0.9655	349.93	0.8852
114.85		234.85	-1.0181	354.85	0.9697
119.96		239.96	-0.9913	359.96	1.0056

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	155: 1	0.9976		0.9989	0.9989	0.9976	0.9976		0.9830
8.94	155: 2	0.9363		0.9389	0.9415	0.9349	0.9376		0.9296
13.93	155: 3	0.8365		0.8365	0.8392	0.8313	0.8365		0.8364
19.85	155: 4	0.6806		0.6792	0.6898	0.6713	0.6819		0.7037
23.96	155: 5	0.4967		0.4954	0.4993	0.4863	0.5020		0.5418
64.00	155: 1	-1.2976	-1.3529	-1.3266	-1.3081	-1.3081	-1.2410	-1.2645	
68.94	155: 2	-1.3893	-1.4837	-1.4089	-1.3709	-1.3198	-1.3814	-1.2931	
73.93	155: 3	-1.4123	-1.5472	-1.4256	-1.3740	-1.4520	-1.3701	-1.3819	
78.85	155: 4	-1.4085	-1.5609	-1.4615	-1.4125	-1.4416	-1.4377	-1.4363	
83.96	155: 5	-1.2080	-1.4426	-1.3286	-1.3286	-1.2906	-1.2971	-1.2756	
124.00	155: 1			-0.9953	-1.0058	-0.9979	-0.9560	-0.9936	-0.9448
128.94	155: 2			-0.9964	-1.0095	-0.9208	-1.0082	-0.9862	-0.9521
133.93	155: 3			-1.0398	-0.9938	-1.0740	-0.9741	-0.9721	-0.9669
138.85	155: 4			-1.0213	-1.0279	-1.0318	-1.0345	-1.0049	-0.9255
143.96	155: 5			-1.0268	-1.0254	-1.0163	-1.0320	-0.9860	-0.9624

REY NO. = 6.136 E+6   K/D = 0.0100   MACH NO. = 0.179
      CD = 1.044   CL = -0.014   RUN ID = 156

THETA	CP	THETA	CP	THETA	CP
0.00	1.0062	120.00	-0.9949	240.00	-0.9984
5.04	0.9913	125.04	-1.0350	245.04	-1.0029
9.96	0.9152	129.96	-1.0072	249.96	-1.0076
15.02	0.7926	135.02	-1.0613	255.02	-0.9694
20.01	0.6285	140.01	-1.0325	260.01	-1.0118
20.00	0.6577	140.00	-1.0319	260.00	-1.0061
25.04	0.4622	145.04	-1.0640	265.04	-1.0695
29.96	0.2270	149.96	-1.0311	269.96	-1.1355
35.02	-0.0335	155.02	-1.0858	275.02	-1.3416
40.01	-0.3086	160.01	-1.0216	280.01	-1.4967
40.00		160.00	-0.9947	280.00	-1.4943
45.04		165.04	-1.0981	285.04	-1.5330
49.96		169.96	-1.1136	289.96	-1.4982
55.02		175.02	-1.1172	295.02	-1.4005
60.01		180.01	-1.0873	300.01	-1.2916
60.00	-1.2459	180.00	-1.1061	300.00	-1.3285
65.04	-1.4174	185.04	-1.0953	305.04	-1.1353
69.96	-1.4723	189.96	-1.0364	309.96	-0.8901
75.02	-1.5212	195.02	-1.1050	315.02	-0.6374
80.01	-1.4632	200.01	-1.0836	320.01	-0.3608
80.00	-1.4256	200.00	-1.0551	320.00	-0.3340
85.04	-1.3651	205.04	-1.0561	325.04	-0.0799
89.96	-1.1885	209.96	-1.0411	329.96	0.1704
95.02	-1.0762	215.02	-1.0676	335.02	0.4088
100.01	-1.0558	220.01	-1.0472	340.01	0.6104
100.00		220.00	-1.1200	340.00	0.5771
105.04		225.04	-1.0178	345.04	0.7519
109.96		229.96	-1.0151	349.96	0.8826
115.02		235.02	-1.0461	355.02	0.9725
120.01		240.01	-0.9940	360.01	1.0061

				CP	VS.	X/D			
THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	156: 1	0.9960		0.9979	0.9979	0.9960	0.9951		0.9849
9.04	156: 2	0.9447		0.9419	0.9475	0.9429	0.9438		0.9372
13.96	156: 3	0.8373		0.8355	0.8373	0.8309	0.8336		0.8408
19.02	156: 4	0.6836		0.6836	0.6901	0.6789	0.6873		0.7093
24.01	156: 5	0.4927		0.4927	0.5020	0.4880	0.4955		0.5340
64.00	156: 1	-1.3247	-1.3729	-1.3136	-1.2978	-1.3099	-1.2765	-1.2780	
69.04	156: 2	-1.3773	-1.5228	-1.4724	-1.4463	-1.4174	-1.3643	-1.3782	
73.96	156: 3	-1.4481	-1.5568	-1.4704	-1.4342	-1.3998	-1.4212	-1.3801	
79.02	156: 4	-1.4512	-1.5763	-1.4838	-1.4754	-1.4241	-1.4138	-1.4043	
84.01	156: 5	-1.2900	-1.4772	-1.3160	-1.2862	-1.2555	-1.3626	-1.3643	
124.00	156: 1			-1.0080	-1.0181	-0.9978	-0.9830	-0.9975	-0.9696
129.04	156: 2			-1.0473	-1.0492	-1.0622	-0.9945	-1.0048	-1.0029
133.96	156: 3			-1.0043	-1.0431	-1.0043	-1.0431	-0.9816	-0.9742
139.02	156: 4			-1.0514	-1.0672	-1.0300	-1.0346	-1.0003	-0.9395
144.01	156: 5			-1.0689	-1.0689	-1.0290	-1.0429	-0.9987	-1.0668

ROUGH CYLINDER (NO. 6 MESH SCREEN)

REY NO. = 6.710 E+6   K/D = 0.0100   MACH NO. = 0.200
CD = 1.058   CL = -0.022   RUN ID = 157

THETA	CP	THETA	CP	THETA	CP
0.02	1.0100	120.02	-1.0392	240.02	-1.0339
4.98	0.9897	124.98	-1.0223	244.98	-1.0170
9.97	0.9156	129.97	-1.0320	249.97	-1.0425
14.88	0.8005	134.88	-1.0565	254.88	-1.0384
20.00	0.6272	140.00	-1.0433	260.00	-1.0365
20.02	0.6579	140.02	-1.0522	260.02	-1.0392
24.98	0.4650	144.98	-1.0526	264.98	-1.0666
29.97	0.2271	149.97	-1.0473	269.97	-1.1562
34.88	-0.0184	154.88	-1.1128	274.88	-1.3447
40.00	-0.3071	160.00	-1.1239	280.00	-1.4942
40.02		160.02	-1.0670	280.02	-1.5356
44.98		164.98	-1.0606	284.98	-1.5654
49.97		169.97	-1.0485	289.97	-1.5482
54.88		174.88	-1.0979	294.88	-1.4295
60.00		180.00	-1.2068	300.00	-1.2871
60.02	-1.2457	180.02	-1.1446	300.02	-1.3445
64.98	-1.3959	184.98	-1.1291	304.98	-1.1397
69.97	-1.4713	189.97	-1.1056	309.97	-0.8971
74.88	-1.5161	194.88	-1.111?	314.88	-0.6513
80.00	-1.5226	200.00	-1.101?	320.00	-0.3727
80.02	-1.4818	200.02	-1.1017	320.02	-0.3539
84.98	-1.3375	204.98	-1.0568	324.98	-0.0829
89.97	-1.1623	209.97	-1.0770	329.97	0.1753
94.88	-1.0768	214.88	-1.0670	334.88	0.4041
100.00	-1.0832	220.00	-1.0267	340.00	0.6159
100.02		220.02	-0.9894	340.02	0.5812
104.98		224.98	-1.0162	344.98	0.7551
109.97		229.97	-1.0485	349.97	0.8862
114.88		234.88	-1.0467	354.88	0.9754
120.00		240.00	-1.0244	360.00	1.0093

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	157: 1	0.9987		0.9995	0.9995	0.9995	1.0002		0.9859
8.98	157: 2	0.9446		0.9446	0.9423	0.9393	0.9416		0.9355
13.97	157: 3	0.8377		0.8399	0.8384	0.8317	0.8384		0.8382
18.88	157: 4	0.6932		0.6924	0.6947	0.6812	0.6924		0.7123
24.00	157: 5	0.4903		0.4895	0.5023	0.4858	0.5031		0.5383
64.02	157: 1	-1.3173	-1.4018	-1.3867	-1.3392	-1.3030	-1.2924	-1.2781	
68.98	157: 2	-1.3952	-1.5157	-1.4750	-1.4373	-1.3823	-1.3808	-1.3912	
73.97	157: 3	-1.4457	-1.5616	-1.5029	-1.4532	-1.4239	-1.4367	-1.4213	
78.88	157: 4	-1.4076	-1.5666	-1.4664	-1.4423	-1.4566	-1.3888	-1.4590	
84.00	157: 5	-1.3323	-1.4750	-1.3769	-1.3255	-1.3633	-1.3134	-1.3258	
124.02	157: 1			-1.0680	-1.0425	-1.0125	-1.0110	-1.0241	-0.9894
128.98	157: 2			-1.0758	-1.0683	-0.9800	-1.0354	-1.0380	-1.0192
133.97	157: 3			-1.0689	-1.0629	-1.0338	-1.04??	-0.9824	-0.9817
138.88	157: 4			-1.0537	-1.0567	-1.0635	-0.996?	-1.0429	-1.0301
144.00	157: 5			-1.0766	-1.0871	-1.0773	-1.0278	-1.0274	-1.0319

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 0.421 E+6   K/D = 0.0003   MACH NO. = 0.239
CD = 0.513   CL = -0.088   RUN ID = 188

THETA	CP	THETA	CP	THETA	CP
0.00	0.9359	120.00	-1.5089	240.00	-1.4393
4.93	0.9808	124.93	-1.1188	244.93	-1.7648
9.95	0.8696	129.95	-0.8382	249.95	-2.6648
14.90	0.7194	134.90	-0.6624	254.90	-2.8203
19.98	0.5304	139.98	-0.5910	259.98	-2.7626
20.00	0.5438	140.00	-0.6346	260.00	-2.8434
24.93	0.3225	144.93	-0.5621	264.93	-2.9391
29.95	0.0226	149.95	-0.5590	269.95	-3.0253
34.90	-0.3210	154.90	-0.6074	274.90	-3.1613
39.98	-0.6518	159.98	-0.6115	279.98	-2.9364
40.00		160.00	-0.6551	280.00	-3.0340
44.93		164.93	-0.5929	284.93	-2.8386
49.95		169.95	-0.5801	289.95	-2.6459
54.90		174.90	-0.6181	294.90	-2.4598
59.98		179.98	-0.5785	299.98	-2.0384
60.00	-1.9790	180.00		300.00	-2.1777
64.93	-2.2224	184.93		304.93	-1.8085
69.95	-2.5410	189.95		309.95	-1.4258
74.90	-2.8410	194.90		314.90	-1.1091
79.98	-2.9128	199.98		319.98	-0.6623
80.00	-2.8097	200.00	-0.6327	320.00	-0.7666
84.93	-2.8721	204.93	-0.5929	324.93	-0.3804
89.95	-2.9584	209.95	-0.6024	329.95	-0.0443
94.90	-2.9969	214.90	-0.6071	334.90	0.2482
99.98	-2.7463	219.98	-0.5468	339.98	0.5085
100.00		220.00	-0.5991	340.00	0.4654
104.93		224.93	-0.6040	344.93	0.7019
109.95		229.95	-0.7473	349.95	0.8582
114.90		234.90	-1.1111	354.90	0.9487
119.98		239.98	-1.4437	359.98	0.9937

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	188: 1	0.9136		0.9136	0.9359	0.9359	0.9359		0.9582
8.93	188: 2	0.9029		0.9029	0.8917	0.8917	0.9140		0.9362
13.95	188: 3	0.7584		0.7695	0.7584	0.7584	0.7695		0.8247
18.90	188: 4	0.5774		0.5774	0.6102	0.5774	0.5883		0.6751
23.98	188: 5	0.3619		0.3724	0.3724	0.3619	0.3724		0.4874
64.00	188: 1	-1.8781	-1.9117	-2.0014	-2.2256	-2.3153	-2.2032	-1.9911	
68.93	188: 2	-2.0326	-2.0326	-2.1554	-2.4121	-2.5237	-2.3674	-2.1350	
73.95	188: 3	-2.2290	-2.2067	-2.0395	-2.5299	-2.7639	-2.6413	-2.3893	
78.90	188: 4	-2.4358	-2.2715	-2.0086	-2.6767	-2.8958	-2.8629	-2.6133	
83.98	188: 5	-2.4377	-2.0998	-1.8148	-2.5433	-2.8178	-2.7650	-2.5878	
124.00	188: 1			-0.6903	-0.9576		-0.6457	-0.7559	-0.6551
128.93	188: 2			-0.6399	-0.6399		-0.6065	-0.5259	-0.5706
133.95	188: 3			-0.6255	-0.6477		-0.6255	-0.5689	-0.6024
138.90	188: 4			-0.6618	-0.6727		-0.6400	-0.6838	-0.6619
143.98	188: 5			-0.6744	-0.6220		-0.5695	-0.6523	-0.6523

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 0.509 E+6   K/D = 0.0003   MACH NO. = 0.243
       CD = 0.572   CL = -0.048   RUN ID = 189

THETA	CP	THETA	CP	THETA	CP
0.00	0.9970	120.00	-1.6165	240.00	-1.5257
4.94	0.9882	124.94	-1.2793	244.94	-1.9345
9.91		129.91		249.91	
14.88	0.7423	134.88	-0.7409	254.88	-2.7453
19.99	0.5649	139.99	-0.6013	259.99	-2.8061
20.00	0.5694	140.00	-0.6067	260.00	-2.8653
24.94	0.3399	144.94	-0.5845	264.94	-3.0044
29.91		149.91		269.91	
34.88	-0.2977	154.88	-0.6225	274.88	-3.1142
39.99	-0.6242	159.99	-0.6332	279.99	-2.9736
40.00		160.00	-0.5987	280.00	-2.9991
44.94		164.94	-0.6198	284.94	-2.8532
49.91		169.91		289.91	
54.88		174.88	-0.6583	294.88	-2.4084
59.99		179.99	-0.6437	299.99	-2.0438
60.00	-1.9536	180.00		300.00	-2.1031
64.94	-2.2533	184.94		304.94	-1.7915
69.91		189.91		309.91	
74.88	-2.8358	194.88		314.88	-1.0728
79.99	-2.9525	199.99		319.99	-0.6763
80.00	-2.8653	200.00	-0.6700	320.00	-0.7134
84.94	-2.9688	204.94	-0.6464	324.94	-0.3617
89.91		209.91		329.91	
94.88	-3.0789	214.88	-0.6231	334.88	0.2573
99.99	-2.8085	219.99	-0.6089	339.99	0.5293
100.00		220.00	-0.6254	340.00	0.5070
104.94		224.94	-0.6553	344.94	0.7217
109.91		229.91		349.91	
114.88		234.88	-1.1074	354.88	0.9531
119.99		239.99	-1.4861	359.99	1.0064

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	189: 1	0.9792		0.9792	0.9792	0.9792	0.9792		0.9970
8.94	189: 2	0.9262		0.9351	0.9439	0.9174	0.9439		0.9526
13.91	189: 3								
18.88	189: 4	0.5929		0.6281	0.6193	0.6369	0.6369		0.7153
23.99	189: 5	0.3917		0.4264	0.4177	0.4177	0.4177		0.5207
64.00	189: 1	-1.8644	-1.8466	-1.9179	2.0784	-2.0427	-1.8912	-1.8574	
68.94	189: 2	-2.0668	-2.0046	-2.1378	-2.3332	-2.2622	-2.1201	-2.0974	
73.91	189: 3								
78.88	189: 4	-2.4393	-2.1485	-1.8842	-2.5626	-2.5979	-2.4393	-2.4348	
83.99	189: 5	-2.4489	-1.9714	-1.6502	-2.5010	-2.6226	-2.4489	-2.4870	
124.00	189: 1			-0.8194	-1.0055	-0.7042	-0.7131	-0.7680	-0.6432
128.94	189: 2			-0.7524	-0.7347	-0.6817	-0.7082	-0.6286	-0.6375
133.91	189: 3								
138.88	189: 4			-0.6838	-0.6488	-0.7013	-0.6751	-0.6143	-0.6319
143.99	189: 5			-0.6418	-0.6677	-0.7022	-0.6764	-0.6263	-0.6350

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 0.647 E+6	K/D = 0.0003	MACH NO. = 0.246
CD = 0.664	CL = -0.229	RUN ID = 192

THETA	CP	THETA	CP	THETA	CP
0.01		120.01		240.01	
4.94	1.0220	124.94	-0.8240	244.94	-2.0297
9.92	0.9471	129.92	-0.8642	249.92	-2.7331
14.85	0.8059	134.85	-0.7945	254.85	-2.7791
19.99	0.6180	139.99	-0.7779	259.99	-2.8797
20.01		140.01		260.01	
24.94	0.3479	144.94	-0.8527	264.94	-3.0038
29.92	0.0599	149.92	-0.8508	269.92	-3.1126
34.85	-0.2582	154.85	-0.8446	274.85	-3.0582
39.99	-0.5999	159.99	-0.7579	279.99	-2.9702
40.01		160.01		280.01	
44.94		164.94	-0.7899	284.94	-2.8267
49.92		169.92	-0.7532	289.92	-2.6684
54.85		174.85	-0.7668	294.85	-2.3737
59.99		179.99	-0.7159	299.99	-2.0568
60.01		180.01		300.01	
64.94	-2.1288	184.94		304.94	-1.7767
69.92	-2.4168	189.92		309.92	-1.4138
74.85	-2.5532	194.85		314.85	-1.0507
79.99	-2.8324	199.99		319.99	-0.6607
80.01		200.01		320.01	
84.94	-2.6223	204.94	-0.7150	324.94	-0.3671
89.92	-2.7504	209.92	-0.7054	329.92	-0.0356
94.85	-2.6787	214.85	-0.6787	334.85	0.2498
99.99	-2.6252	219.99	-0.6821	339.99	0.5421
100.01		220.01		340.01	
104.94		224.94	-0.7490	344.94	0.7088
109.92		229.92	-0.9716	349.92	0.8718
114.85		234.85	-1.1191	354.85	0.9542
119.99		239.99	-1.7099	359.99	1.0152

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	192: 1								
8.94	192: 2	0.9610		0.9610	0.9610	0.9610	0.9610		0.9335
13.92	192: 3	0.8451		0.8519	0.8519	0.8519	0.8519		0.8377
18.85	192: 4	0.6575		0.6777	0.6777	0.6710	0.6642		0.6900
23.99	192: 5	0.4363		0.4632	0.4565	0.4565	0.4497		0.5084
64.01	192: 1								
68.94	192: 2	-1.9995	-1.9314	-2.0471	-2.1628	-2.2105	-2.0880	-2.0637	
73.92	192: 3	-2.2121	-2.0756	-1.8914	-2.3622	-2.3554	-2.2530	-2.2584	
78.85	192: 4	-2.3365	-2.0589	-1.7136	-2.3907	-2.4787	-2.3026	-2.3804	
83.99	192: 5	-2.4267	-1.9601	-1.5882	-2.4267	-2.5484	-2.3861	-2.4763	
124.01	192: 1								
128.94	192: 2			-0.7106	-0.7038	-0.7444	-0.7579	-0.5856	-0.6469
133.92	192: 3			-0.7016	-0.7151	-0.7016	-0.7151	-0.6303	-0.6849
138.85	192: 4			-0.6828	-0.7165	-0.6963	-0.6963	-0.6313	-0.6652
143.99	192: 5			-0.6773	-0.7041	-0.6907	-0.6974	-0.6686	-0.6889

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 0.721 E+6   K/D = 0.0003   MACH NO. = 0.246
CD = 0.690   CL = -0.215   RUN ID = 193

THETA	CP	THETA	CP	THETA	CP
0.01	1.0092	120.01	-1.1318	240.01	-1.6835
4.95	0.9849	124.95	-0.9066	244.95	-2.0054
9.92	0.9179	129.92	-0.8679	249.92	-2.5719
14.88	0.7855	134.88	-0.8455	254.88	-2.7182
19.99	0.6133	139.99	-0.8080	259.99	-2.7756
20.01	0.6024	140.01	-0.8405	260.01	-2.8348
24.95	0.3777	144.95	-0.8808	264.95	-2.9805
29.92	0.0837	149.92	-0.9035	269.92	-3.0313
34.88	-0.2317	154.88	-0.8527	274.88	-3.0031
39.99	-0.5532	159.99	-0.7549	279.99	-2.8960
40.01		160.01	-0.8265	280.01	-2.9261
44.95		164.95	-0.8324	284.95	-2.8041
49.92		169.92	-0.7388	289.92	-2.5925
54.88		174.88	-0.7546	294.88	-2.3243
59.99		179.99	-0.7418	299.99	-1.9934
60.01	-1.8519	180.01		300.01	-2.0321
64.95	-2.0511	184.95		304.95	-1.7110
69.92	-2.3637	189.92		309.92	-1.3775
74.88	-2.5280	194.88		314.88	-0.9944
79.99	-2.7010	199.99		319.99	-0.6073
80.01	-2.5551	200.01	-0.7536	320.01	-0.6602
84.95	-2.5487	204.95	-0.7352	324.95	-0.3267
89.92	-2.7205	209.92	-0.7388	329.92	-0.0198
94.88	-2.7667	214.88	-0.6879	334.88	0.3009
99.99	-2.4567	219.99	-0.6756	339.99	0.5585
100.01		220.01	-0.6989	340.01	0.5357
104.95		224.95	-0.7413	344.95	0.7238
109.92		229.92	-0.8119	349.92	0.8812
114.88		234.88	-1.0939	354.88	0.9970
119.99		239.99	-1.5601	359.99	1.0393

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	193: 1	1.0031		0.9970	0.9970	1.0031	1.0031		1.0031
8.95	193: 2	0.9303		0.9364	0.9243	0.9303	0.9303		0.9545
13.92	193: 3	0.8146		0.8207	0.8268	0.8207	0.8268		0.8386
18.88	193: 4	0.6404		0.6646	0.6646	0.6646	0.6585		0.7246
23.99	193: 5	0.4333		0.4693	0.4573	0.4453	0.4633		0.5405
64.01	193: 1	-1.7425	-1.7425	-1.6818	-1.9430	-1.9308	-1.8154	-1.8009	
68.95	193: 2	-1.9660	-1.8993	-1.7717	-2.0693	-2.1421	-2.0268	-2.0257	
73.92	193: 3	-2.1567	-1.9924	-1.7793	-2.2663	-2.3333	-2.2055	-2.2635	
78.88	193: 4	-2.3100	-1.9587	-1.6437	-2.3342	-2.4129	-2.3160	-2.3546	
83.99	193: 5	-2.3402	-1.8832	-1.4502	-2.3342	-2.4605	-2.2560	-2.3604	
124.01	193: 1			-0.6894	-0.7680	-0.7619	-0.7680	-0.6442	-0.6563
128.95	193: 2			-0.6393	-0.6876	-0.7601	-0.7480	-0.6136	-0.6258
133.92	193: 3			-0.6675	-0.7038	-0.7582	-0.7461	-0.6353	-0.6535
138.88	193: 4			-0.6538	-0.7321	-0.7201	-0.7623	-0.6212	-0.6636
143.99	193: 5			-0.6592	-0.7070	-0.6891	-0.6951	-0.6335	-0.6515

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 0.823 E+6   K/D = 0.0003   MACH NO. = 0.246
CD = 0.679   CL = -0.311   RUN ID = 194

THETA	CP	THETA	CP	THETA	CP
0.01	1.0046	120.01	-0.8459	240.01	-1.6072
4.96	0.9887	124.96	-0.8338	244.96	-1.9467
9.92	0.9090	129.92	-0.8305	249.92	-2.2814
14.89	0.7835	134.89	-0.8282	254.89	-2.6575
19.99	0.6101	139.99	-0.8098	259.99	-2.7379
20.01	0.6011	140.01	-0.8595	260.01	-2.7337
24.96	0.3731	144.96	-0.8528	264.96	-2.9007
29.92	0.1066	149.92	-0.8824	269.92	-2.9686
34.89	-0.1980	154.89	-0.8476	274.89	-2.9306
39.99	-0.5230	159.99	-0.7658	279.99	-2.8512
40.01		160.01	-0.8519	280.01	-2.8507
44.96		164.96	-0.8161	284.96	-2.7413
49.92		169.92	-0.7926	289.92	-2.5484
54.89		174.89	-0.7789	294.89	-2.2703
59.99		179.99	-0.7137	299.99	-1.9650
60.01	-1.7366	180.01		300.01	-1.9896
64.96	-1.9765	184.96		304.96	-1.6751
69.92	-2.2442	189.92		309.92	-1.3493
74.89	-2.3925	194.89		314.89	-0.9788
79.99	-2.5405	199.99		319.99	-0.6125
80.01	-2.3880	200.01	-0.7455	320.01	-0.6411
84.96	-2.3800	204.96	-0.7205	324.96	-0.3167
89.92	-2.3782	209.92	-0.7501	329.92	-0.0050
94.89	-2.2914	214.89	-0.6892	334.89	0.2978
99.99	-2.1918	219.99	-0.6768	339.99	0.5569
100.01		220.01	-0.7029	340.01	0.5374
104.96		224.96	-0.7205	344.96	0.7286
109.92		229.92	-0.8511	349.92	0.8770
114.89		234.89	-1.1589	354.89	0.9783
119.99		239.99	-1.5202	359.99	1.0310

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.01	194: 1	0.9993		0.9940	0.9940	0.9993	0.9940		1.0046
8.96	194: 2	0.9357		0.9357	0.9357	0.9357	0.9410		0.9409
13.92	194: 3	0.8135		0.8188	0.8188	0.8188	0.8241		0.8398
18.89	194: 4	0.6466		0.6571	0.6571	0.6571	0.6571		0.7093
23.99	194: 5	0.4313		0.4628	0.4523	0.4471	0.4523		0.5411
64.01	194: 1	-1.7100	-1.7047	-1.6038	-1.8428	-1.8747	-1.7737	-1.7818	
68.96	194: 2	-1.9023	-1.8598	-1.7166	-2.0296	-2.0826	-1.9925	-2.0240	
73.92	194: 3	-2.0687	-1.9570	-1.7125	-2.1804	-2.2761	-2.1538	-2.2133	
78.89	194: 4	-2.1921	-1.9283	-1.5960	-2.2237	-2.3292	-2.2396	-2.2967	
83.99	194: 5	-2.2666	-1.7978	-1.3237	-2.2613	-2.3878	-2.2245	-2.2815	
124.01	194: 1			-0.6430	-0.7169	-0.7592	-0.7486	-0.6497	-0.6763
128.96	194: 2			-0.6311	-0.7419	-0.7472	-0.7683	-0.6303	-0.6409
133.92	194: 3			-0.6551	-0.7132	-0.7344	-0.7502	-0.6278	-0.6437
138.89	194: 4			-0.6587	-0.7269	-0.7374	-0.7794	-0.6417	-0.6523
143.99	194: 5			-0.6401	-0.7187	-0.7187	-0.7344	-0.6558	-0.682'

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 0.923 E+6		K/D = 0.0003	MACH NO. = 0.247
CD = 0.690		CL = -0.283	RUN ID = 195

THETA	CP	THETA	CP	THETA	CP
0.02	1.0200	120.02	-0.8436	240.02	-1.3794
4.94	0.9919	124.94	-0.8507	244.94	-1.7597
9.91	0.9171	129.91	-0.8523	249.91	-2.0328
14.85	0.7953	134.85	-0.8423	254.85	-2.5767
19.97	0.6048	139.97	-0.8791	259.97	-2.6213
20.02	0.6017	140.02	-0.8500	260.02	-2.6320
24.94	0.3821	144.94	-0.8249	264.94	-2.7637
29.91	0.1214	149.91	-0.8853	269.91	-2.7997
34.85	-0.1793	154.85	-0.8526	274.85	-2.8406
39.97	-0.5355	159.97	-0.7835	279.97	-2.7594
40.02		160.02	-0.8336	280.02	-2.7779
44.94		164.94	-0.8378	284.94	-2.6274
49.91		169.91	-0.8136	289.91	-2.5041
54.85		174.85	-0.7619	294.85	-2.2214
59.97		179.97	-0.7610	299.97	-1.9128
60.02	-1.6948	180.02		300.02	-1.9363
64.94	-1.9560	184.94		304.94	-1.6163
69.91	-2.1166	189.91		309.91	-1.2592
74.85	-2.3306	194.85		314.85	-0.9522
79.97	-2.4636	199.97		319.97	-0.5823
80.02	-2.3073	200.02	-0.7489	320.02	-0.6203
84.94	-2.3031	204.94	-0.7531	324.94	-0.2840
89.91	-2.2507	209.91	-0.7526	329.91	0.0185
94.85	-2.1416	214.85	-0.7526	334.85	0.3079
99.97	-2.0110	219.97	-0.7142	339.97	0.5482
100.02		220.02	-0.6972	340.02	0.5406
104.94		224.94	-0.7484	344.94	0.7386
109.91		229.91	-0.7526	349.91	0.8936
114.85		234.85	-1.0058	354.85	0.9778
119.97		239.97	-1.4341	359.97	1.0153

CP VS. X/D

THETA	RUN:SEG	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.02	195: 1	1.0059		1.0106	1.0059	1.0106	1.0059		0.9918
8.94	195: 2	0.9357		0.9403	0.9450	0.9450	0.9450		0.9403
13.91	195: 3	0.8189		0.8282	0.8282	0.8282	0.8282		0.8515
18.85	195: 4	0.6503		0.6643	0.6643	0.6596	0.6643		0.7108
23.97	195: 5	0.4369		0.4555	0.4508	0.4369	0.4508		0.5295
64.02	195: 1	-1.6619	-1.6619	-1.5492	-1.7934	-1.8310	-1.7464	-1.7473	
68.94	195: 2	-1.9090	-1.7964	-1.6274	-1.9607	-2.0358	-1.9560	-2.0022	
73.91	195: 3	-2.0230	-1.8826	-1.6251	-1.9013	-2.1822	-2.2243	-2.0724	
78.85	195: 4	-2.1525	-1.8948	-1.7402	-1.6839	-2.3353	-2.1994	-2.2401	
83.97	195: 5	-2.2111	-1.8043	-1.6126	-2.2111	-2.4308	-2.1924	-2.2122	
124.02	195: 1			-0.6396	-0.7331	-0.7518	-0.7893	-0.6360	-0.6831
128.94	195: 2			-0.6241	-0.7969	-0.7502	-0.7502	-0.6214	-0.6450
133.91	195: 3			-0.6291	-0.7502	-0.7176	-0.8666	-0.6447	-0.6447
138.85	195: 4			-0.6943	-0.6570	-0.7502	-0.7408	-0.6822	-0.7010
143.97	195: 5			-0.6766	-0.7370	-0.7416	-0.8021	-0.6628	-0.6721

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 1.025 E+6   K/D = 0.0003   MACH NO. = 0.246
CD = 0.690   CL = -0.194   RUN ID = 196

THETA	CP	THETA	CP	THETA	CP
0.00	1.0153	120.00	-0.8785	240.00	-0.9866
4.93	0.9983	124.93	-0.8771	244.93	-1.2616
9.92	0.9221	129.92	-0.8627	249.92	-1.4714
14.90	0.8005	134.90	-0.8912	254.90	-1.7441
19.98	0.6474	139.98	-0.9161	259.98	-2.3938
20.00	0.6050	140.00	-0.8904	260.00	-2.4968
24.93	0.3853	144.93	-0.8812	264.93	-2.5747
29.92	0.1223	149.92	-0.8712	269.92	-2.5837
34.90	-0.1814	154.90	-0.8204	274.90	-2.6331
39.98	-0.4779	159.98	-0.7950	279.98	-2.6421
40.00		160.00	-0.8342	280.00	-2.6960
44.93		164.93	-0.8087	284.93	-2.5874
49.92		169.92	-0.8106	289.92	-2.3930
54.90		174.90	-0.8117	294.90	-2.1439
59.98		179.98	-0.7437	299.98	-1.8168
60.00	-1.6468	180.00		300.00	-1.9073
64.93	-1.8911	184.93		304.93	-1.5932
69.92	-2.1005	189.92		309.92	-1.2700
74.90	-2.2407	194.90		314.90	-0.9104
79.98	-2.3873	199.98		319.98	-0.5406
80.00	-2.1791	200.00	-0.7834	320.00	-0.6131
84.93	-2.1513	204.93	-0.8045	324.93	-0.2742
89.92	-2.1175	209.92	-0.8614	329.92	0.0418
94.90	-1.9752	214.90	-0.9087	334.90	0.3157
99.98	-1.8084	219.98	-0.7772	339.98	0.6012
100.00		220.00	-0.7538	340.00	0.5416
104.93		224.93	-0.7833	344.93	0.7404
109.92		229.92	-0.7979	349.92	0.8967
114.90		234.90	-0.8370	354.90	0.9899
119.98		239.98	-0.9196	359.98	1.0487

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.00	196: 1	1.0068		0.9984	1.0068	1.0068	0.9984		0.9899
8.93	196: 2	0.9477		0.9477	0.9434	0.9477	0.9477		0.9434
13.92	196: 3	0.8249		0.8249	0.8206	0.8206	0.8206		0.8501
18.90	196: 4	0.6574		0.6742	0.6616	0.6532	0.6574		0.7160
23.98	196: 5	0.4635		0.4886	0.4803	0.4594	0.4719		0.5594
64.00	196: 1	-1.6511	-1.6553	-1.5664	-1.7738	-1.8077	-1.7400	-1.7173	
68.93	196: 2	-1.8446	-1.8700	-1.6711	-1.7473	-2.0096	-1.9884	-1.9651	
73.92	196: 3	-2.0116	-1.8635	-1.7957	-2.1217	-2.2064	-2.1259	-2.0963	
78.90	196: 4	-2.1059	-1.9332	-1.7984	-2.1691	-2.3334	-2.3123	-2.1270	
83.98	196: 5	-2.1990	-1.6633	-1.4498	-2.0483	-2.4292	-2.3162	-2.0933	
124.00	196: 1			-0.6759	-0.8189	-0.7642	-0.7684	-0.6819	-0.7327
128.93	196: 2			-0.6458	-0.7425	-0.7172	-0.8686	-0.7029	-0.6521
133.92	196: 3			-0.7280	-0.8207	-0.6859	-0.9007	-0.6878	-0.7259
138.90	196: 4			-0.7282	-0.7534	-0.7324	-0.8623	-0.6893	-0.6978
143.98	196: 5			-0.6493	-0.7242	-0.7409	-0.8241	-0.7144	-0.664'

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 1.267 E+6	K/D = 0.0003	MACH NO. = 0.245
CD = 0.688	CL = -0.106	RUN ID = 198

THETA	CP	THETA	CP	THETA	CP
0.05	1.0187	120.05	-0.8150	240.05	-0.8215
4.97	0.9976	124.97	-0.8466	244.97	-0.8999
9.97	0.9172	129.97	-0.8314	249.97	-1.0089
14.92	0.7912	134.92	-0.8502	254.92	-1.3911
20.01	0.5984	140.01	-0.8590	260.01	-1.5403
20.05	0.6119	140.05	-0.7885	260.05	-1.9567
24.97	0.3875	144.97	-0.8751	264.97	-2.2272
29.97	0.1245	149.97	-0.8647	269.97	-2.2357
34.92	-0.1844	154.92	-0.8897	274.92	-2.3887
40.01	-0.5216	160.01	-0.8339	280.01	-2.4236
40.05		160.05	-0.8039	280.05	-2.4696
44.97		164.97	-0.8121	284.97	-2.3782
49.97		169.97	-0.8262	289.97	-2.1479
54.92		174.92	-0.8115	294.92	-2.0375
60.01		180.01	-0.8443	300.01	-1.7802
60.05	-1.5573	180.05		300.05	-1.8249
64.97	-1.8363	184.97		304.97	-1.5163
69.97	-2.0257	189.97		309.97	-1.1832
74.92	-2.2045	194.92		314.92	-0.8788
80.01	-2.3269	200.01		320.01	-0.5496
80.05	-2.0375	200.05	-0.8039	320.05	-0.5872
84.97	-2.0129	204.97	-0.8015	324.97	-0.2506
89.97	-1.8986	209.97	-0.8297	329.97	0.0614
94.92	-1.7284	214.92	-0.8396	334.92	0.3312
100.01	-1.6044	220.01	-0.8654	340.01	0.5590
100.05		220.05	-0.8145	340.05	0.5488
104.97		224.97	-0.8156	344.97	0.7487
109.97		229.97	-0.8332	349.97	0.8854
114.92		234.92	-0.8537	354.92	0.9835
120.01		240.01	-0.8970	360.01	1.0151

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.05	198: 1	1.0082		1.0082	1.0082	1.0082	1.0047		0.9976
8.97	198: 2	0.9382		0.9452	0.9417	0.9452	0.9417		0.9485
13.97	198: 3	0.8158		0.8193	0.8228	0.8228	0.8263		0.8538
18.92	198: 4	0.6514		0.6653	0.6653	0.6653	0.6723		0.7205
24.01	198: 5	0.4093		0.4408	0.4443	0.4338	0.4443		0.5379
64.05	198: 1	-1.6275	-1.6731	-1.5257	-1.6731	-1.7819	-1.6907	-1.6511	
68.97	198: 2	-1.7942	-1.7626	-1.6223	-1.8749	-1.9240	-1.8468	-1.7881	
73.97	198: 3	-2.0081	-1.8854	-1.6188	-2.0116	-2.0888	-1.9555	-1.9162	
78.92	198: 4	-2.0958	-1.8819	-1.5417	-1.6820	-2.1344	-1.9766	-1.9145	
84.01	198: 5	-2.2286	-1.8074	-1.5827	-1.4739	-2.1760	-2.0110	-1.8610	
124.05	198: 1			-0.6838	-0.8373	-0.8269	-0.9106	-0.7161	-0.7126
128.97	198: 2			-0.6868	-0.8786	-0.7600	-0.8577	-0.6961	-0.6891
133.97	198: 3			-0.7077	-0.7879	-0.7391	-0.8577	-0.7559	-0.7067
138.92	198: 4			-0.7153	-0.7362	-0.7781	-0.8408	-0.7413	-0.7062
144.01	198: 5			-0.7502	-0.7222	-0.7781	-0.8269	-0.7424	-0.7037

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 1.532 E+6   K/D = 0.0003   MACH NO. = 0.247
CD = 0.685   CL = 0.014   RUN ID = 199

THETA	CP	THETA	CP	THETA	CP
0.06	1.0152	120.06	-0.8156	240.06	-0.8458
4.99	0.9924	124.99	-0.8235	244.99	-0.8515
9.96	0.9190	129.96	-0.7752	249.96	-0.8332
14.92	0.7893	134.92	-0.8200	254.92	-0.8506
20.01	0.6076	140.01	-0.8304	260.01	-1.0026
20.06	0.6216	140.06	-0.7494	260.06	-1.3419
24.99	0.3962	144.99	-0.7721	264.99	-1.4441
29.96	0.1235	149.96	-0.8181	269.96	-1.6378
34.92	-0.1593	154.92	-0.8116	274.92	-1.9291
40.01	-0.5084	160.01	-0.7920	280.01	-2.0220
40.06		160.06	-0.8458	280.06	-2.2058
44.99		164.99	-0.7543	284.99	-2.1190
49.96		169.96	-0.7934	289.96	-2.0164
54.92		174.92	-0.7599	294.92	-1.8611
60.01		180.01	-0.8718	300.01	-1.6380
60.06	-1.5201	180.06		300.06	-1.7174
64.99	-1.7476	184.99		304.99	-1.4321
69.96	-1.9462	189.96		309.96	-1.1575
74.92	-2.0679	194.92		314.92	-0.8159
80.01	-2.1354	200.01		320.01	-0.4914
80.06	-1.9827	200.06	-0.8115	320.06	-0.5479
84.99	-1.7672	204.99	-0.8144	324.99	-0.2398
89.96	-1.7516	209.96	-0.8190	329.96	0.0581
94.92	-1.5348	214.92	-0.8364	334.92	0.3445
100.01	-1.5158	220.01	-0.8462	340.01	0.5698
100.06		220.06	-0.8401	340.06	0.5503
104.99		224.99	-0.8201	344.99	0.7471
109.96		229.96	-0.8276	349.96	0.8875
114.92		234.92	-0.8109	354.92	0.9814
120.01		240.01	-0.8349	360.01	1.0096

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.06	199: 1	1.0067		1.0010	1.0038	1.0038	0.9981		0.9952
8.99	199: 2	0.9412		0.9412	0.9441	0.9441	0.9441		0.9410
13.96	199: 3	0.8170		0.8312	0.8312	0.8312	0.8340		0.8477
18.92	199: 4	0.6537		0.6679	0.6679	0.6622	0.6679		0.7181
24.01	199: 5	0.4321		0.4604	0.4604	0.4547	0.4632		0.5386
64.06	199: 1	-1.5116	-1.6600	-1.5401	-1.5430	-1.6372	-1.5829	-1.5593	
68.99	199: 2	-1.7362	-1.7476	-1.6620	-1.7077	-1.7362	-1.6163	-1.6872	
73.96	199: 3	-1.8610	-1.9547	-1.7105	-1.7275	-1.8326	-1.7133	-1.8143	
78.92	199: 4	-1.8895	-1.7083	-1.5271	-1.5951	-1.9461	-1.8187	-1.7731	
84.01	199: 5	-1.9111	-1.5875	-1.3292	-1.3491	-1.9196	-1.5847	-1.6267	
124.06	199: 1			-0.7437	-0.7012	-0.8147	-0.8771	-0.7058	-0.6800
128.99	199: 2			-0.7579	-0.7437	-0.7324	-0.7040	-0.7086	-0.6915
133.96	199: 3			-0.8011	-0.7559	-0.8379	-0.7983	-0.7650	-0.7138
138.92	199: 4			-0.7413	-0.7328	-0.8539	-0.8229	-0.7570	-0.7173
144.01	199: 5			-0.7638	-0.7412	-0.8174	-0.7892	-0.7439	-0.7183

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 2.076 E+6   K/D = 0.0003   MACH NO. = 0.246
CD = 0.815   CL = 0.066   RUN ID = 200

THETA	CP	THETA	CP	THETA	CP
0.08	1.0172	120.08	-0.9052	240.08	-0.8887
5.04	0.9993	125.04	-0.8846	245.04	-0.9169
10.02	0.9205	130.02	-0.8992	250.02	-0.9243
14.92	0.8014	134.92	-0.8839	254.92	-0.8917
20.05	0.6259	140.05	-0.9178	260.05	-0.9003
20.08	0.6212	140.08	-0.8998	260.08	-0.9523
25.04	0.4005	145.04	-0.9439	265.04	-1.0309
30.02	0.1476	150.02	-0.9297	270.02	-1.3196
34.92	-0.1349	154.92	-0.9408	274.92	-1.7342
40.05	-0.4306	160.05	-0.8970	280.05	-1.8766
40.08		160.08	-0.8927	280.08	-1.8135
45.04		165.04	-0.9783	285.04	-1.9185
50.02		170.02	-0.9263	290.02	-1.8406
54.92		174.92	-0.9606	294.92	-1.7342
60.05		180.05	-0.9316	300.05	-1.5244
60.08	-1.4827	180.08		300.08	-1.5119
65.04	-1.7434	185.04		305.04	-1.3169
70.02	-1.8744	190.02		310.02	-1.0335
74.92	-1.9533	194.92		314.92	-0.7532
80.05	-1.9507	200.05		320.05	-0.4482
80.08	-1.9077	200.08	-0.9045	320.08	-0.4532
85.04	-1.9067	205.04	-0.8852	325.04	-0.1647
90.02	-1.7064	210.02	-0.8967	330.02	0.1220
94.92	-1.4946	214.92	-0.8721	334.92	0.3656
100.05	-1.1604	220.05	-0.9101	340.05	0.6005
100.08		220.08	-0.9222	340.08	0.5977
105.04		225.04	-0.9268	345.04	0.7721
110.02		230.02	-0.8986	350.02	0.9087
114.92		234.92	-0.9114	354.92	0.9858
120.05		240.05	-0.9081	360.05	1.0212

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	200: 1	1.0074		1.0113	1.0094	1.0074	1.0113		0.9996
9.04	200: 2	0.9479		0.9499	0.9519	0.9539	0.9539		0.9519
14.02	200: 3	0.8258		0.8318	0.8337	0.8377	0.8416		0.8574
18.92	200: 4	0.6660		0.6699	0.6777	0.6758	0.6875		0.7228
24.05	200: 5	0.4557		0.4635	0.4694	0.4753	0.4831		0.5418
64.08	200: 1	-1.4945	-1.6260	-1.5946	-1.6377	-1.6515	-1.5749	-1.5506	
69.04	200: 2	-1.6406	-1.7770	-1.7770	-1.7256	-1.7928	-1.7375	-1.7090	
74.02	200: 3	-1.5549	-1.8211	-1.8428	-1.7837	-1.8665	-1.7442	-1.8465	
78.92	200: 4	-1.6706	-1.7511	-1.8218	-1.7491	-1.8905	-1.7727	-1.8069	
84.05	200: 5	-1.6355	-1.5494	-1.6473	-1.5885	-1.6962	-1.6140	-1.6731	
124.08	200: 1			-0.8940	-0.8998	-0.9213	-0.8959	-0.8691	-0.8966
129.04	200: 2			-0.9498	-0.8633	-0.9046	-0.9262	-0.8673	-0.9426
134.02	200: 3			-0.9395	-0.8826	-0.9100	-0.8885	-0.9263	-0.7998
138.92	200: 4			-0.9467	-0.8900	-0.9271	-0.9076	-0.8839	-0.8504
144.05	200: 5			-0.9126	-0.9165	-0.8639	-0.9457	-0.8179	-0.3807

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 2.571 E+6   K/D = 0.0003   MACH NO. = 0.247
CD = 0.871   CL = 0.019   RUN ID = 201

THETA	CP	THETA	CP	THETA	CP
0.08	1.0169	120.08	-0.9363	240.08	-0.9111
5.04	0.9950	125.04	-0.9529	245.04	-0.9418
9.99	0.9205	129.99	-0.9716	249.99	-0.9393
15.00	0.7975	135.00	-0.9226	255.00	-0.9203
20.09	0.6223	140.09	-0.9635	260.09	-0.9486
20.08	0.6183	140.08	-0.9850	260.08	-0.9708
25.04	0.4012	145.04	-1.0007	265.04	-0.9967
29.99	0.1478	149.99	-0.9721	269.99	-1.3314
35.00	-0.1211	155.00	-0.9882	275.00	-1.5634
40.09	-0.4237	160.09	-1.0075	280.09	-1.8077
40.08		160.08	-1.0040	280.08	-1.7982
45.04		165.04	-1.0155	285.04	-1.8831
49.99		169.99	-0.9567	289.99	-1.8332
55.00		175.00	-1.0365	295.00	-1.6715
60.09		180.09	-1.0087	300.09	-1.5016
60.08	-1.4998	180.08		300.08	-1.5330
65.04	-1.7142	185.04		305.04	-1.2789
69.99	-1.8293	189.99		309.99	-1.0288
75.00	-1.8751	195.00		315.00	-0.7284
80.09	-1.8526	200.09		320.09	-0.4474
80.08	-1.8673	200.08	-0.9757	320.08	-0.4565
85.04	-1.7549	205.04	-0.9763	325.04	-0.1646
89.99	-1.4955	209.99	-1.0057	329.99	0.1115
95.00	-1.1153	215.00	-0.9235	335.00	0.3782
100.09	-0.9635	220.09	-0.9597	340.09	0.5928
100.08		220.08	-0.9757	340.08	0.5853
105.04		225.04	-0.9356	345.04	0.7716
109.99		229.99	-0.9599	349.99	0.9016
115.00		235.00	-0.9250	355.00	0.9903
120.09		240.09	-0.9375	360.09	1.0168

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	201: 1	1.0074		1.0074	1.0074	1.0090	1.0074		0.9965
9.04	201: 2	0.9419		0.9434	0.9465	0.9465	0.9481		0.9497
13.99	201: 3	0.8226		0.8257	0.8320	0.8289	0.8383		0.8527
19.00	201: 4	0.6597		0.6722	0.6738	0.6753	0.6832		0.7163
24.09	201: 5	0.4519		0.4582	0.4645	0.4629	0.4803		0.5361
64.08	201: 1	-1.4684	-1.6302	-1.6475	-1.6035	-1.6349	-1.5187	-1.5423	
69.04	201: 2	-1.6001	-1.7830	-1.7643	-1.7861	-1.7627	-1.7017	-1.7049	
73.99	201: 3	-1.6509	-1.8119	-1.8798	-1.8356	-1.9067	-1.7851	-1.7796	
79.00	201: 4	-1.6198	-1.7357	-1.7670	-1.7514	-1.7921	-1.6997	-1.8281	
84.09	201: 5	-1.5040	-1.5971	-1.6775	-1.6633	-1.6949	-1.5071	-1.7020	
124.08	201: 1			-0.9709	-0.9349	-0.9412	-0.8818	-0.8922	-0.8765
129.04	201: 2			-0.9353	-0.9447	-0.9291	-0.9213	-0.8870	-0.9183
133.99	201: 3			-0.9753	-0.9658	-0.9627	-0.9188	-0.9045	-0.8776
139.00	201: 4			-0.9446	-0.9119	-0.9306	-0.9181	-0.9392	-0.8701
144.09	201: 5			-0.9902	-0.9620	-0.9478	-0.8772	-0.9581	-0.8948

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 3.109 E+6   K/D = 0.0003   MACH NO. = 0.248
CD = 0.899   CL = -0.004   RUN ID = 202

THETA	CP	THETA	CP	THETA	CP
0.08	1.0155	120.08	-0.9529	240.08	-0.9336
5.10	0.9958	125.10	-0.9453	245.10	-0.9494
10.07	0.9224	130.07	-0.9916	250.07	-0.9446
15.04	0.7995	135.04	-0.9663	255.04	-0.9522
20.11	0.6321	140.11	-0.9496	260.11	-0.9055
20.08	0.6209	140.08	-0.9671	260.08	-0.9400
25.10	0.3983	145.10	-0.9889	265.10	-1.0259
30.07	0.1524	150.07	-0.9728	270.07	-1.2433
35.04	-0.1127	155.04	-1.0062	275.04	-1.5360
40.11	-0.3911	160.11	-1.0051	280.11	-1.7515
40.08		160.08	-1.0021	280.08	-1.7247
45.10		165.10	-1.0783	285.10	-1.8424
50.07		170.07	-1.0002	290.07	-1.8111
55.04		175.04	-1.0622	295.04	-1.6872
60.11		180.11	-1.0556	300.11	-1.4761
60.08	-1.4555	180.08		300.08	-1.5005
65.10	-1.6882	185.10		305.10	-1.2956
70.07	-1.7665	190.07		310.07	-1.0240
75.04	-1.8190	195.04		315.04	-0.7413
80.11	-1.7537	200.11		320.11	-0.4218
80.08	-1.8022	200.08	-0.9969	320.08	-0.4366
85.10	-1.6864	205.10	-0.9963	325.10	-0.1551
90.07	-1.3517	210.07	-1.0080	330.07	0.1137
95.04	-1.0568	215.04	-0.9988	335.04	0.3726
100.11	-0.9188	220.11	-0.9453	340.11	0.5957
100.08		220.08	-0.9633	340.08	0.5899
105.10		225.10	-0.9364	345.10	0.7711
110.07		230.07	-0.9692	350.07	0.9019
115.04		235.04	-0.9160	355.04	0.9844
120.11		240.11	-0.9312	360.11	1.0168

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	202: 1	1.0026		1.0052	1.0052	1.0064	1.0039		0.9948
9.10	202: 2	0.9425		0.9425	0.9451	0.9464	0.9490		0.9439
14.07	202: 3	0.8269		0.8307	0.8307	0.8346	0.8359		0.8490
19.04	202: 4	0.6664		0.6703	0.6728	0.6741	0.6832		0.7198
24.11	202: 5	0.4679		0.4692	0.4756	0.4756	0.4910		0.5445
64.08	202: 1	-1.4271	-1.6117	-1.6207	-1.6142	-1.6104	-1.5497	-1.5182	
69.10	202: 2	-1.5959	-1.7922	-1.7805	-1.7727	-1.7597	-1.7064	-1.7098	
74.07	202: 3	-1.6632	-1.8194	-1.8245	-1.8387	-1.7987	-1.7832	-1.7440	
79.04	202: 4	-1.6019	-1.8009	-1.7905	-1.7544	-1.7634	-1.7350	-1.7737	
84.11	202: 5	-1.4490	-1.5924	-1.6103	-1.5604	-1.6168	-1.5092	-1.6157	
124.08	202: 1			-0.9671	-0.9491	-0.9337	-0.9337	-0.8844	-0.8935
129.10	202: 2			-0.9643	-0.9695	-0.9178	-0.9385	-0.9572	-0.9078
134.07	202: 3			-0.9599	-0.9895	-0.9201	-0.9535	-0.9369	-0.9369
139.04	202: 4			-0.9651	-0.9587	-0.8995	-0.9381	-0.9173	-0.8822
144.11	202: 5			-0.9593	-0.9236	-0.9312	-0.8968	-0.9145	-0.8657

II-7

ROUGH CYLINDER (NO. 250 MESH SCREEN)

THETA	CP	THETA	CP	THETA	CP
0.08	1.0154	120.08	-0.9705	240.08	-0.9687
5.12	0.9952	125.12	-0.9357	245.12	-0.9355
10.11	0.9216	130.11	-0.9521	250.11	-0.9285
15.07	0.8007	135.07	-0.9773	255.07	-0.9686
20.13	0.6257	140.13	-0.9460	260.13	-0.9946
20.08	0.6200	140.08	-1.0014	260.08	-0.9714
25.12	0.4076	145.12	-0.9825	265.12	-1.0225
30.11	0.1589	150.11	-0.9610	270.11	-1.2322
35.07	-0.1224	155.07	-1.0215	275.07	-1.6048
40.13	-0.4056	160.13	-0.9754	280.13	-1.7914
40.08		160.08	-1.0085	280.08	-1.7946
45.12		165.12	-1.0620	285.12	-1.8220
50.11		170.11	-1.0369	290.11	-1.7809
55.07		175.07	-1.0351	295.07	-1.7178
60.13		180.13	-1.0062	300.13	-1.5219
60.08	-1.5022	180.08		300.08	-1.5262
65.12	-1.6505	185.12		305.12	-1.2697
70.11	-1.7254	190.11		310.11	-1.0163
75.07	-1.8747	195.07		315.07	-0.7517
80.13	-1.7418	200.13		320.13	-0.4365
80.08	-1.7772	200.08	-1.0104	320.08	-0.4599
85.12	-1.6310	205.12	-0.9848	325.12	-0.1416
90.11	-1.2738	210.11	-0.9788	330.11	0.1213
95.07	-1.0396	215.07	-0.9999	335.07	0.3656
100.13	-0.9441	220.13	-0.9521	340.13	0.5907
100.08		220.08	-0.9833	340.08	0.5881
105.12		225.12	-0.9963	345.12	0.7708
110.11		230.11	-0.9585	350.11	0.9015
115.07		235.07	-0.9872	355.07	0.9861
120.13		240.13	-0.9685	360.13	1.0184

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	203: 1	1.0019		1.0019	1.0028	1.0048	1.0058		0.9961
9.12	203: 2	0.9402		0.9440	0.9431	0.9450	0.9450		0.9432
14.11	203: 3	0.8230		0.8258	0.8307	0.8326	0.8346		0.8522
19.07	203: 4	0.6621		0.6699	0.6719	0.6729	0.6817		0.7134
24.13	203: 5	0.4612		0.4651	0.4699	0.4719	0.4825		0.5453
64.08	203: 1	-1.4510	-1.6096	-1.6348	-1.6174	-1.6493	-1.5990	-1.5354	
69.12	203: 2	-1.5628	-1.7730	-1.7209	-1.7180	-1.7499	-1.7286	-1.6590	
74.11	203: 3	-1.6346	-1.7969	-1.8491	-1.8008	-1.8037	-1.8211	-1.6978	
79.07	203: 4	-1.6096	-1.7831	-1.7772	-1.7646	-1.8610	-1.7987	-1.7197	
84.13	203: 5	-1.4666	-1.6134	-1.5680	-1.5960	-1.6375	-1.6491	-1.5605	
124.08	203: 1			-0.9552	-0.9629	-0.9312	-0.9581	-0.9018	-0.9299
129.12	203: 2			-0.9258	-0.9278	-0.9345	-0.9748	-0.8689	-0.8949
134.11	203: 3			-0.9812	-0.9264	-0.9620	-0.9620	-0.8936	-0.8946
139.07	203: 4			-0.9430	-0.9702	-1.0031	-0.9828	-0.9081	-0.9090
144.13	203: 5			-0.9629	-0.9619	-0.9456	-0.9888	-0.9056	-0.8785

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 5.143 E+6		K/D = 0.0003		MACH NO. = 0.248	
CD = 0.897		CL = 0.002		RUN ID = 204	

THETA	CP	THETA	CP	THETA	CP
0.08	1.0138	120.08	-0.9608	240.08	-0.9464
5.10	0.9924	125.10	-0.9430	245.10	-0.9424
10.07	0.9218	130.07	-0.9520	250.07	-0.9368
15.08	0.7991	135.08	-0.9903	255.08	-0.9299
20.13	0.6305	140.13	-0.9816	260.13	-0.9680
20.08	0.6122	140.08	-0.9938	260.08	-0.9424
25.10	0.4084	145.10	-0.9652	265.10	-1.0196
30.07	0.1466	150.07	-1.0437	270.07	-1.2584
35.08	-0.1170	155.08	-1.0138	275.08	-1.5664
40.13	-0.4180	160.13	-1.0003	280.13	-1.7854
40.08		160.08	-1.0170	280.08	-1.7821
45.10		165.10	-1.0314	285.10	-1.8295
50.07		170.07	-1.0235	290.07	-1.8133
55.08		175.08	-1.0174	295.08	-1.6928
60.13		180.13	-1.0419	300.13	-1.5295
60.08	-1.4843	180.08		300.08	-1.5192
65.10	-1.6729	185.10		305.10	-1.2895
70.07	-1.8331	190.07		310.07	-1.0216
75.08	-1.8746	195.08		315.08	-0.7396
80.13	-1.7977	200.13		320.13	-0.4472
80.08	-1.8191	200.08	-1.0262	320.08	-0.4569
85.10	-1.6032	205.10	-1.0053	325.10	-0.1619
90.07	-1.3519	210.07	-0.9875	330.07	0.1190
95.08	-1.0692	215.08	-1.0182	335.08	0.3661
100.13	-0.9671	220.13	-0.9803	340.13	0.5937
100.08		220.08	-0.9617	340.08	0.5892
105.10		225.10	-0.9539	345.10	0.7681
110.07		230.07	-0.9575	350.07	0.9006
115.08		235.08	-0.9522	355.08	0.9840
120.13		240.13	-0.9603	360.13	1.0162

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	204: 1	1.0016		1.0016	1.0038	1.0016	1.0016		0.9916
9.10	204: 2	0.9410		0.9410	0.9433	0.9440	0.9448		0.9457
14.07	204: 3	0.8243		0.8266	0.8312	0.8336	0.8366		0.8501
19.08	204: 4	0.6671		0.6694	0.6725	0.6764	0.6871		0.7237
24.13	204: 5	0.4518		0.4611	0.4657	0.4703	0.4796		0.5483
64.08	204: 1	-1.4421	-1.6393	-1.6585	-1.6240	-1.6324	-1.6140	-1.5773	
69.10	204: 2	-1.5986	-1.7641	-1.7817	-1.7518	-1.7894	-1.7312	-1.6660	
74.07	204: 3	-1.6507	-1.8408	-1.8163	-1.7756	-1.8032	-1.7832	-1.7933	
79.08	204: 4	-1.6055	-1.7971	-1.8070	-1.8170	-1.8147	-1.7503	-1.8157	
84.13	204: 5	-1.4864	-1.6885	-1.6693	-1.7101	-1.6240	-1.6209	-1.6256	
124.08	204: 1			-0.9511	-0.9503	-0.9495	-0.9259	-0.9295	-0.8849
129.10	204: 2			-0.9437	-0.9263	-0.9545	-0.9385	-0.9371	-0.9148
134.07	204: 3			-0.9598	-0.9271	-0.9057	-0.9286	-0.9084	-0.9529
139.08	204: 4			-0.9742	-0.9689	-0.9339	-0.9232	-0.9460	-0.8816
144.13	204: 5			-0.9568	-0.9957	-0.9185	-0.9820	-0.9372	-0.9280

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 6.192 E+6   K/D = 0.0003   MACH NO. = 0.249
CD = 0.879   CL = 0.009   RUN ID = 205

THETA	CP	THETA	CP	THETA	CP
0.08	1.0144	120.08	-0.9588	240.08	-0.9255
5.10	0.9953	125.10	-0.9529	245.10	-0.9302
10.07	0.9222	130.07	-0.9720	250.07	-0.9261
15.08	0.8000	135.08	-0.9685	255.08	-0.9423
20.09	0.6256	140.09	-0.9680	260.09	-0.9478
20.08	0.6216	140.08	-0.9513	260.08	-0.8760
25.10	0.4076	145.10	-0.9813	265.10	-0.9580
30.07	0.1587	150.07	-0.9590	270.07	-1.1648
35.08	-0.1281	155.08	-0.9795	275.08	-1.5096
40.09	-0.4147	160.09	-0.9541	280.09	-1.6623
40.08		160.08	-0.9598	280.08	-1.7524
45.10		165.10	-0.9989	285.10	-1.8829
50.07		170.07	-1.0181	290.07	-1.8166
55.08		175.08	-0.9993	295.08	-1.7257
60.09		180.09	-1.0317	300.09	-1.5223
60.08	-1.4716	180.08		300.08	-1.4959
65.10	-1.6894	185.10		305.10	-1.3059
70.07	-1.7604	190.07		310.07	-1.0303
75.08	-1.8586	195.08		315.08	-0.7466
80.09	-1.7983	200.09		320.09	-0.4386
80.08	-1.7699	200.08	-1.0073	320.08	-0.4329
85.10	-1.6623	205.10	-0.9895	325.10	-0.1713
90.07	-1.3357	210.07	-1.0055	330.07	0.1091
95.08	-1.0658	215.08	-0.9727	335.08	0.3653
100.09	-0.9542	220.09	-0.9648	340.09	0.5926
100.08		220.08	-0.9442	340.08	0.5954
105.10		225.10	-0.9227	345.10	0.7678
110.07		230.07	-0.9268	350.07	0.8999
115.08		235.08	-0.9378	355.08	0.9838
120.09		240.09	-0.9307	360.09	1.0142

				CP	VS.	X/D			
THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	205: 1	1.0019		1.0031	1.0025	1.0031	1.0031		0.9957
9.10	205: 2	0.9417		0.9417	0.9449	0.9449	0.9468		0.9457
14.07	205: 3	0.8270		0.8326	0.8326	0.8345	0.8364		0.8540
19.08	205: 4	0.6637		0.6701	0.6732	0.6758	0.6834		0.7204
24.09	205: 5	0.4531		0.4632	0.4720	0.4752	0.4834		0.5467
64.08	205: 1	-1.4192	-1.5920	-1.5964	-1.6257	-1.5958	-1.5658	-1.5036	
69.10	205: 2	-1.5660	-1.7701	-1.7845	-1.7675	-1.7631	-1.7153	-1.6945	
74.07	205: 3	-1.6100	-1.7919	-1.8026	-1.8643	-1.8202	-1.8013	-1.8368	
79.08	205: 4	-1.6287	-1.7870	-1.7972	-1.8124	-1.8218	-1.7832	-1.7537	
84.09	205: 5	-1.4526	-1.6646	-1.7151	-1.6230	-1.6141	-1.4968	-1.6700	
124.08	205: 1			-0.8968	-0.9395	-0.8912	-0.9290	-0.8762	-0.8874
129.10	205: 2			-0.9393	-0.9462	-0.8774	-0.8918	-0.8867	-0.8981
134.07	205: 3			-0.9270	-0.9502	-0.9164	-0.9227	-0.9633	-0.8632
139.08	205: 4			-0.9330	-0.9393	-0.9191	-0.9185	-0.8714	-0.8980
144.09	205: 5			-0.9792	-0.9215	-0.9196	-0.8826	-0.9137	-0.9143

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 7.009 E+6	K/D = 0.0003	MACH NO. = 0.248
CD = 0.837	CL = 0.013	RUN ID = 206

THETA	CP	THETA	CP	THETA	CP
0.08	1.0155	120.08	-0.9142	240.08	-0.9083
5.10	0.9964	125.10	-0.8915	245.10	-0.8932
10.07	0.9212	130.07	-0.9288	250.07	-0.9169
15.08	0.8010	135.08	-0.9107	255.08	-0.9197
20.09	0.6277	140.09	-0.9185	260.09	-0.8979
20.08	0.6322	140.08	-0.9257	260.08	-0.8595
25.10	0.4116	145.10	-0.9293	265.10	-0.9276
30.07	0.1548	150.07	-0.9334	270.07	-1.1722
35.08	-0.1268	155.08	-0.9487	275.08	-1.3851
40.09	-0.4089	160.09	-0.9480	280.09	-1.6361
40.08		160.08	-0.9654	280.08	-1.7461
45.10		165.10	-0.9771	285.10	-1.8161
50.07		170.07	-0.9611	290.07	-1.8101
55.08		175.08	-0.9488	295.08	-1.7152
60.09		180.09	-0.9548	300.09	-1.5041
60.08	-1.4535	180.08		300.08	-1.5087
65.10	-1.6489	185.10		305.10	-1.2746
70.07	-1.8113	190.07		310.07	-1.0303
75.08	-1.8620	195.08		315.08	-0.7436
80.09	-1.7962	200.09		320.09	-0.4406
80.08	-1.7912	200.08	-0.9325	320.08	-0.4552
85.10	-1.6467	205.10	-0.8949	325.10	-0.1514
90.07	-1.3104	210.07	-0.9423	330.07	0.1201
95.08	-1.0381	215.08	-0.9247	335.08	0.3604
100.09	-0.9073	220.09	-0.9068	340.09	0.5924
100.08		220.08	-0.9242	340.08	0.5840
105.10		225.10	-0.9157	345.10	0.7691
110.07		230.07	-0.9257	350.07	0.9011
115.08		235.08	-0.8805	355.08	0.9851
120.09		240.09	-0.9113	360.09	1.0164

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	206: 1	1.0056		1.0051	1.0062	1.0051	1.0067		0.9996
9.10	206: 2	0.9410		0.9427	0.9443	0.9443	0.9481		0.9489
14.07	206: 3	0.8282		0.8326	0.8326	0.8326	0.8387		0.8553
19.08	206: 4	0.6620		0.6620	0.6676	0.6737	0.6827		0.7208
24.09	206: 5	0.4603		0.4587	0.4626	0.4648	0.4815		0.5407
64.08	206: 1	-1.4239	-1.6158	-1.6038	-1.5753	-1.5977	-1.5533	-1.5055	
69.10	206: 2	-1.5712	-1.7316	-1.7710	-1.7201	-1.7672	-1.6544	-1.6484	
74.07	206: 3	-1.6262	-1.8202	-1.8533	-1.8080	-1.8616	-1.7970	-1.7879	
79.08	206: 4	-1.5418	-1.8183	-1.8670	-1.8071	-1.8049	-1.7192	-1.8225	
84.09	206: 5	-1.4627	-1.5930	-1.6670	-1.6330	-1.7026	-1.5540	-1.5544	
124.08	206: 1			-0.8920	-0.8860	-0.9023	-0.8838	-0.8442	-0.8283
129.10	206: 2			-0.9108	-0.8613	-0.9157	-0.8531	-0.8390	-0.8521
134.07	206: 3			-0.9328	-0.9158	-0.9169	-0.9130	-0.9086	-0.9041
139.08	206: 4			-0.9282	-0.9298	-0.9204	-0.9326	-0.9589	-0.9029
144.09	206: 5			-0.9165	-0.9231	-0.9298	-0.8600	-0.8444	-0.9504

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 2.887 E+6   K/D = 0.0003   MACH NO. = 0.113
CD = 0.782   CL = -0.005   RUN ID = 208

THETA	CP	THETA	CP	THETA	CP
0.08	0.9968	120.08	-0.8243	240.08	-0.8402
4.99	0.9840	124.99	-0.8068	244.99	-0.8475
9.94	0.9115	129.94	-0.8938	249.94	-0.8506
14.94	0.7923	134.94	-0.8020	254.94	-0.8191
20.01	0.6210	140.01	-0.8070	260.01	-0.8688
20.08	0.6043	140.08	-0.8522	260.08	-0.7931
24.99	0.4035	144.99	-0.8121	264.99	-0.8382
29.94	0.1579	149.94	-0.8471	269.94	-1.1171
34.94	-0.0824	154.94	-0.8153	274.94	-1.3797
40.01	-0.3857	160.01	-0.8396	280.01	-1.5448
40.08		160.08	-0.8621	280.08	-1.6382
44.99		164.99	-0.9167	284.99	-1.7430
49.94		169.94	-0.8822	289.94	-1.6990
54.94		174.94	-0.8411	294.94	-1.5711
60.01		180.01	-0.9542	300.01	-1.4250
60.08	-1.3699	180.08		300.08	-1.4141
64.99	-1.5242	184.99		304.99	-1.2285
69.94	-1.6560	189.94		309.94	-0.9666
74.94	-1.6639	194.94		314.94	-0.6846
80.01	-1.6491	200.01		320.01	-0.4078
80.08	-1.6694	200.08	-0.7996	320.08	-0.4236
84.99	-1.5859	204.99	-0.8349	324.99	-0.1645
89.94	-1.2524	209.94	-0.8948	329.94	0.1108
94.94	-0.8492	214.94	-0.8222	334.94	0.3630
100.01	-0.8669	220.01	-0.8372	340.01	0.5684
100.08		220.08	-0.8559	340.08	0.5732
104.99		224.99	-0.8034	344.99	0.7424
109.94		229.94	-0.8758	349.94	0.8803
114.94		234.94	-0.8411	354.94	0.9715
120.01		240.01	-0.8435	360.01	0.9966

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	208: 1	0.9874		0.9874	0.9874	0.9874	0.9874		0.9781
8.99	208: 2	0.9211		0.9274	0.9337	0.9274	0.9274		0.9245
13.94	208: 3	0.8170		0.8265	0.8233	0.8233	0.8296		0.8427
18.94	208: 4	0.6571		0.6603	0.6697	0.6697	0.6760		0.7081
24.01	208: 5	0.4538		0.4601	0.4664	0.4633	0.4696		0.5337
64.08	208: 1	-1.3294	-1.5069	-1.4882	-1.5225	-1.5194	-1.4664	-1.4293	
68.99	208: 2	-1.4457	-1.6247	-1.6184	-1.5775	-1.6498	-1.6184	-1.5922	
73.94	208: 3	-1.5617	-1.6717	-1.6622	-1.7219	-1.7534	-1.6843	-1.7084	
78.94	208: 4	-1.5258	-1.4944	-1.6983	-1.6513	-1.7078	-1.6670	-1.6621	
84.01	208: 5	-1.4160	-1.5358	-1.5011	-1.5011	-1.5830	-1.4822	-1.5637	
124.08	208: 1			-0.8151	-0.8305	-0.8213	-0.8368	-0.8027	-0.8496
128.99	208: 2			-0.8434	-0.8059	-0.8277	-0.8465	-0.8223	-0.8034
133.94	208: 3			-0.7878	-0.8846	-0.8347	-0.8409	-0.8569	-0.8664
138.94	208: 4			-0.8403	-0.8715	-0.8372	-0.8559	-0.8285	-0.8348
144.01	208: 5			-0.8396	-0.8459	-0.8616	-0.8083	-0.7898	-0.7961

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 1.195 E+6   K/D = 0.0003   MACH NO. = 0.046
CD = 0.573   CL = -0.133   RUN ID = 210

THETA	CP	THETA	CP	THETA	CP
0.10	0.9815	120.10	-0.7515	240.10	-0.8495
4.96		124.96		244.96	
10.01	0.8868	130.01	-0.7202	250.01	-0.9491
14.90	0.7737	134.90	-0.7036	254.90	-1.0083
20.03	0.5888	140.03	-0.7400	260.03	-1.2873
20.10	0.5674	140.10	-0.7402	260.10	-1.6363
24.96		144.96		264.96	
30.01	0.1025	150.01	-0.7284	270.01	-1.8600
34.90	-0.1798	154.90	-0.7114	274.90	-2.0130
40.03	-0.5146	160.03	-0.7288	280.03	-2.2176
40.10		160.10	-0.7741	280.10	-2.3521
44.96		164.96		284.96	
50.01		170.01	-0.6494	290.01	-2.0654
54.90		174.90	-0.6521	294.90	-1.8818
60.03		180.03	-0.6498	300.03	-1.7126
60.10	-1.5201	180.10		300.10	-1.7848
64.96		184.96		304.96	
70.01	-1.9322	190.01		310.01	-1.1861
74.90	-2.0106	194.90		314.90	-0.8721
80.03	-2.1022	200.03		320.03	-0.5708
80.10	-1.8814	200.10	-0.7741	320.10	-0.6370
84.96		204.96		324.96	
90.01	-1.6544	210.01	-0.7993	330.01	-0.0283
94.90	-1.4705	214.90	-0.7645	334.90	0.2878
100.03	-1.1701	220.03	-0.7999	340.03	0.4952
100.10		220.10	-0.8118	340.10	0.4920
104.96		224.96		344.96	
110.01		230.01	-0.7618	350.01	0.8497
114.90		234.90	-0.8394	354.90	0.9423
120.03		240.03	-0.8936	360.03	0.9440

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.10	210: 1	0.9815		1.0000	0.9815	0.9815	0.9627		0.9627
8.96	210: 2								
14.01	210: 3	0.8122		0.8122	0.8122	0.8122	0.8122		0.8122
18.90	210: 4	0.6055		0.6617	0.6429	0.6429	0.6429		0.6804
24.03	210: 5	0.4015		0.4202	0.4390	0.4202	0.4202		0.4952
64.10	210: 1	-1.5763	-1.6140	-1.5578	-1.5952	-1.7083	-1.6329	-1.5424	
68.96	210: 2								
74.01	210: 3	-1.8951	-1.8202	-1.8018	-1.6336	-1.9139	-1.8202	-1.8039	
78.90	210: 4	-2.0477	-1.9731	-1.7861	-1.4497	-1.9169	-1.9356	-1.7323	
84.03	210: 5	-2.0089	-1.6724	-1.7845	-1.5229	-1.9901	-1.8406	-1.7126	
124.10	210: 1			-0.7960	-0.7025	-0.7025	-0.7775	-0.6983	-0.6606
128.96	210: 2								
134.01	210: 3			-0.7284	-0.6913	-0.7100	-0.8772	-0.7056	-0.6681
138.90	210: 4			-0.7114	-0.6368	-0.6927	-0.8040	-0.6709	-0.6709
144.03	210: 5			-0.7288	-0.6913	-0.7288	-0.7843	-0.7063	-0.7063

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 1.807 E+6   K/D = 0.0003   MACH NO. = 0.069
CD = 0.697   CL = 0.071   RUN ID = 211

THETA	CP	THETA	CP	THETA	CP
0.10	0.9931	120.10	-0.8317	240.10	-0.8028
5.04	0.9679	125.04	-0.8492	245.04	-0.9270
9.97	0.8946	129.97	-0.8401	249.97	-0.8368
14.94	0.7710	134.94	-0.7758	254.94	-0.8529
20.07		140.07		260.07	
20.10	0.5921	140.10	-0.8208	260.10	-0.8399
25.04	0.3789	145.04	-0.7722	265.04	-1.2421
29.97	0.1257	149.97	-0.8047	269.97	-1.4783
34.94	-0.1616	154.94	-0.8055	274.94	-1.7662
40.07		160.07		280.07	
40.10		160.10	-0.8110	280.10	-1.8709
45.04		165.04	-0.8450	285.04	-1.8968
49.97		169.97	-0.7876	289.97	-1.9283
54.94		174.94	-0.8037	294.94	-1.7744
60.07		180.07		300.07	
60.10	-1.4856	180.10		300.10	-1.5346
65.04	-1.6579	185.04		305.04	-1.3308
69.97	-1.8686	189.97		309.97	-1.0685
74.94	-2.0191	194.94		314.94	-0.8162
80.07		200.07		320.07	
80.10	-1.9281	200.10	-0.7946	320.10	-0.4876
85.04	-1.8640	205.04	-0.8450	325.04	-0.1855
89.97	-1.8220	209.97	-0.8204	329.97	0.0602
94.94	-1.5533	214.94	-0.8037	334.94	0.3130
100.07		220.07		340.07	
100.10		220.10	-0.7864	340.10	0.5513
105.04		225.04	-0.8532	345.04	0.7306
109.97		229.97	-0.7630	349.97	0.8620
114.94		234.94	-0.8119	354.94	0.9512
120.07		240.07		360.07	

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.10	211: 1	0.9767		0.9685	0.9767	0.9685	0.9685		0.9685
9.04	211: 2	0.9269		0.9188	0.9188	0.9269	0.9269		0.9352
13.97	211: 3	0.7965		0.8046	0.8046	0.8128	0.8210		0.8374
18.94	211: 4	0.6319		0.6483	0.6564	0.6564	0.6646		0.6975
24.07	211: 5								
64.10	211: 1	-1.3628	-1.5838	-1.3710	-1.4693	-1.4938	-1.4938	-1.4373	
69.04	211: 2	-1.5680	-1.6579	-1.5762	-1.5352	-1.6907	-1.5108	-1.4712	
73.97	211: 3	-1.6315	-1.6643	-1.6479	-1.5743	-1.7052	-1.5989	-1.5273	
78.94	211: 4	-1.6754	-1.7080	-1.4790	-1.4544	-1.6099	-1.4954	-1.5206	
84.07	211: 5								
124.10	211: 1			-0.6744	-0.7396	-0.7558	-0.7883	-0.6962	-0.7290
129.04	211: 2			-0.7722	-0.6583	-0.8290	-0.7071	-0.6398	-0.7302
133.97	211: 3			-0.7397	-0.6503	-0.7233	-0.6828	-0.6644	-0.7138
138.94	211: 4			-0.6673	-0.6428	-0.6835	-0.6103	-0.6480	-0.8447
144.07	211: 5								

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 2.982 E+6   K/D = 0.0003   MACH NO. = 0.115
CD = 0.782   CL = 0.012   RUN ID = 212

THETA	CP	THETA	CP	THETA	CP
0.08	0.9943	120.08	-0.8424	240.08	-0.8335
4.96	0.9793	124.96	-0.8421	244.96	-0.8600
10.01	0.9103	130.01	-0.8388	250.01	-0.8188
14.95	0.7884	134.95	-0.8693	254.95	-0.8559
19.99	0.6136	139.99	-0.8525	259.99	-0.8262
20.08	0.6070	140.08	-0.8626	260.08	-0.8185
24.96	0.4072	144.96	-0.8799	264.96	-0.8629
30.01	0.1575	150.01	-0.8686	270.01	-1.1169
34.95	-0.1123	154.95	-0.8494	274.95	-1.3583
39.99	-0.3874	159.99	-0.8617	279.99	-1.4918
40.08		160.08	-0.8753	280.08	-1.7280
44.96		164.96	-0.8897	284.96	-1.7469
50.01		170.01	-0.8428	290.01	-1.6431
54.95		174.95	-0.9067	294.95	-1.6028
59.99		179.99	-0.8709	299.99	-1.3967
60.08	-1.3937	180.08		300.08	-1.4576
64.96	-1.5543	184.96		304.96	-1.2171
70.01	-1.7135	190.01		310.01	-0.9807
74.95	-1.6885	194.95		314.95	-0.6998
79.99	-1.7038	199.99		319.99	-0.4023
80.08	-1.6564	200.08	-0.8335	320.08	-0.4417
84.96	-1.4889	204.96	-0.8421	324.96	-0.1708
90.01	-1.2275	210.01	-0.8428	330.01	0.1217
94.95	-0.9975	214.95	-0.8619	334.95	0.3619
99.99	-0.8792	219.99	-0.8649	339.99	0.5783
100.08		220.08	-0.9081	340.08	0.5802
104.96		224.96	-0.8630	344.96	0.7481
110.01		230.01	-0.8278	350.01	0.8835
114.95		234.95	-0.8320	354.95	0.9704
119.99		239.99	-0.8024	359.99	1.0002

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	212: 1	0.9853		0.9883	0.9883	0.9913	0.9913		0.9824
8.96	212: 2	0.9230		0.9260	0.9289	0.9289	0.9289		0.9289
14.01	212: 3	0.8116		0.8176	0.8176	0.8206	0.8266		0.8357
18.95	212: 4	0.6541		0.6571	0.6571	0.6601	0.6661		0.7079
23.99	212: 5	0.4560		0.4679	0.4679	0.4679	0.4709		0.5337
64.08	212: 1	-1.3550	-1.5188	-1.4712	-1.5188	-1.5456	-1.5397	-1.4566	
68.96	212: 2	-1.5039	-1.6165	-1.6669	-1.6284	-1.6610	-1.5662	-1.5808	
74.01	212: 3	-1.5042	-1.6836	-1.6656	-1.6776	-1.7434	-1.6358	-1.7269	
78.95	212: 4	-1.5067	-1.7213	-1.7272	-1.6677	-1.6706	-1.6527	-1.6624	
83.99	212: 5	-1.3977	-1.5790	-1.5225	-1.5344	-1.5730	-1.4512	-1.5632	
124.08	212: 1			-0.7678	-0.8360	-0.8596	-0.8478	-0.8006	-0.7976
128.96	212: 2			-0.8740	-0.8445	-0.8651	0.8121	-0.8451	-0.8481
134.01	212: 3			-0.8478	-0.8388	-0.8121	-0.8210	-0.8308	-0.8428
138.95	212: 4			-0.8790	-0.8345	-0.8464	-0.9027	-0.8320	-0.8529
143.99	212: 5			-0.8469	-0.8647	-0.8262	-0.8322	-0.8262	-0.8411

ROUGH CYLINDER (NO. 250 MESH SCREEN)

| REY NO. = 3.556 E+6 | K/D = 0.0003 | MACH NO. = 0.138 |
| CD = 0.820 | CL = 0.004 | RUN ID = 213 |

THETA	CP	THETA	CP	THETA	CP
0.10	1.0025	120.10	-0.8977	240.10	-0.9117
5.02	0.9840	125.02	-0.8631	245.02	-0.8687
9.96		129.96		249.96	
14.92	0.7915	134.92	-0.8853	254.92	-0.8250
20.05	0.6125	140.05	-0.8921	260.05	-0.8888
20.10	0.6074	140.10	-0.9195	260.10	-0.8123
25.02	0.4055	145.02	-0.8552	265.02	-0.8569
29.96		149.96		269.96	
34.92	-0.0995	154.92	-0.8566	274.92	-1.4669
40.05	-0.3906	160.05	-0.9612	280.05	-1.5702
40.10		160.10	-0.8763	280.10	-1.7052
45.02		165.02	-0.9124	285.02	-1.7597
49.96		169.96		289.96	
54.92		174.92	-0.9785	294.92	-1.5787
60.05		180.05	-0.9725	300.05	-1.4513
60.10	-1.4195	180.10		300.10	-1.4430
65.02	-1.5764	185.02		305.02	-1.2183
69.96		189.96		309.96	
74.92	-1.7366	194.92		314.92	-0.7302
80.05	-1.7154	200.05		320.05	-0.4218
80.10	-1.7093	200.10	-0.9075	320.10	-0.4324
85.02	-1.5418	205.02	-0.8667	325.02	-0.1565
89.96		209.96		329.96	
94.92	-0.9598	214.92	-0.8914	334.92	0.3616
100.05	-0.8775	220.05	-0.8909	340.05	0.5791
100.10		220.10	-0.8846	340.10	0.5762
105.02		225.02	-0.8625	345.02	0.7539
109.96		229.96		349.96	
114.92		234.92	-0.8976	354.92	0.9695
120.05		240.05	-0.8867	360.05	1.0046

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.10	213: 1	0.9900		0.9900	0.9900	0.9900	0.9900		0.9817
9.02	213: 2	0.9280		0.9322	0.9343	0.9322	0.9322		0.9363
13.96	213: 3								
18.92	213: 4	0.6569		0.6631	0.6652	0.6631	0.6714		0.7049
24.05	213: 5	0.4499		0.4624	0.4645	0.4624	0.4749		0.5374
64.10	213: 1	-1.3634	-1.5505	-1.5151	-1.5546	-1.5546	-1.5027	-1.4658	
69.02	213: 2	-1.4706	-1.6697	-1.6676	-1.6572	-1.6552	-1.6344	-1.5958	
73.96	213: 3								
78.92	213: 4	-1.5380	-1.6538	-1.7366	-1.7056	-1.6932	-1.6911	-1.7194	
84.05	213: 5	-1.4236	-1.5653	-1.5341	-1.5591	-1.5862	-1.5070	-1.6265	
124.10	213: 1			-0.8431	-0.8679	-0.8700	-0.8761	-0.8283	-0.8908
129.02	213: 2			-0.8676	-0.8305	-0.8367	-0.8346	-0.7897	-0.8001
133.96	213: 3								
138.92	213: 4			-0.9039	-0.9122	-0.8710	-0.8793	-0.8790	-0.8790
144.05	213: 5			-0.8555	-0.9032	-0.8928	-0.8804	-0.8826	-0.8575

ROUGH CYLINDER (NO. 250 MESH SCREEN)

REY NO. = 4.405 E+6   K/D = 0.0003   MACH NO. = 0.173
CD = 0.830   CL = 0.017   RUN ID = 214

THETA	CP	THETA	CP	THETA	CP
0.08	1.0061	120.08	-0.9250	240.08	-0.8623
5.02	0.9831	125.02	-0.9024	245.02	-0.8919
10.01	0.9142	130.01	-0.8992	250.01	-0.8908
14.95	0.7973	134.95	-0.9036	254.95	-0.8616
20.05	0.6207	140.05	-0.9087	260.05	-0.9391
20.08	0.6142	140.08	-0.9223	260.08	-0.8143
25.02	0.3972	145.02	-0.9152	265.02	-0.8742
30.01	0.1565	150.01	-0.9302	270.01	-1.1191
34.95	-0.1178	154.95	-0.9072	274.95	-1.4156
40.05	-0.4180	160.05	-0.9225	280.05	-1.5782
40.08		160.08	-0.9171	280.08	-1.7158
45.02		165.02	-0.9620	285.02	-1.7732
50.01		170.01	-0.9028	290.01	-1.7840
54.95		174.95	-0.9002	294.95	-1.6111
60.05		180.05	-0.9485	300.05	-1.5260
60.08	-1.4371	180.08		300.08	-1.4531
65.02	-1.6032	185.02		305.02	-1.2505
70.01	-1.7165	190.01		310.01	-1.0101
74.95	-1.7266	194.95		314.95	-0.7355
80.05	-1.7064	200.05		320.05	-0.4354
80.08	-1.7438	200.08	-0.9519	320.08	-0.4534
85.02	-1.6805	205.02	-0.9148	325.02	-0.1673
90.01	-1.3016	210.01	-0.9255	330.01	0.1125
94.95	-0.9887	214.95	-0.9056	334.95	0.3698
100.05	-0.9180	220.05	-0.9378	340.05	0.5769
100.08		220.08	-0.8904	340.08	0.5756
105.02		225.02	-0.9027	345.02	0.7560
110.01		230.01	-0.9015	350.01	0.8916
114.95		234.95	-0.8829	354.95	0.9742
120.05		240.05	-0.9016	360.05	1.0035

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	214: 1	0.9941		0.9954	0.9954	0.9981	0.9954		0.9861
9.02	214: 2	0.9294		0.9294	0.9334	0.9361	0.9361		0.9374
14.01	214: 3	0.8196		0.8209	0.8223	0.8223	0.8289		0.8450
18.95	214: 4	0.6617		0.6643	0.6696	0.6750	0.6763		0.7125
24.05	214: 5	0.4561		0.4534	0.4655	0.4668	0.4721		0.5341
64.08	214: 1	-1.3811	-1.5717	-1.5810	-1.5810	-1.5450	-1.4810	-1.5211	
69.02	214: 2	-1.4984	-1.7470	-1.6919	-1.7255	-1.6905	-1.6596	-1.6872	
74.01	214: 3	-1.5314	-1.7484	-1.7498	-1.7724	-1.7870	-1.7578	-1.7453	
78.95	214: 4	-1.5140	-1.7253	-1.7399	-1.7253	-1.6854	-1.6801	-1.6882	
84.05	214: 5	-1.4042	-1.6074	-1.6061	-1.5647	-1.5901	-1.6034	-1.5969	
124.08	214: 1			-0.8971	-0.9064	-0.8600	-0.8335	-0.8717	-0.8423
129.02	214: 2			-0.8484	-0.9138	-0.8764	-0.8778	-0.9202	-0.8488
134.01	214: 3			-0.8733	-0.9196	-0.9196	-0.9116	-0.8908	-0.8401
138.95	214: 4			-0.8728	-0.9019	-0.8411	-0.8755	-0.8882	-0.8469
144.05	214: 5			-0.9331	-0.8825	-0.9105	-0.9225	-0.8935	-0.8291

ROUGH CYLINDER   (NO. 250 MESH SCREEN)

REY NO. = 5.208 E+6	K/D = 0.0003	MACH NO. = 0.207
CD = 0.854	CL = 0.013	RUN ID = 215

THETA	CP	THETA	CP	THETA	CP
0.08	1.0116	120.08	-0.8927	240.08	-0.9225
5.13	0.9900	125.13	-0.9455	245.13	-0.8927
9.99	0.9185	129.99	-0.9244	249.99	-0.8904
14.95	0.7956	134.95	-0.9096	254.95	-0.8738
20.01	0.6213	140.01	-0.9544	260.01	-0.9563
20.08	0.6174	140.08	-0.9670	260.08	-0.8767
25.13	0.3964	145.13	-0.9567	265.13	-0.9690
29.99	0.1515	149.99	-0.9498	269.99	-1.1511
34.95	-0.1096	154.95	-0.9267	274.95	-1.4439
40.01	-0.4101	160.01	-0.9869	280.01	-1.6441
40.08		160.08	-0.9999	280.08	-1.7432
45.13		165.13	-0.9746	285.13	-1.7680
49.99		169.99	-0.9988	289.99	-1.7852
54.95		174.95	-0.9444	294.95	-1.6327
60.01		180.01	-1.0131	300.01	-1.5147
60.08	-1.4754	180.08		300.08	-1.4902
65.13	-1.6709	185.13		305.13	-1.2783
69.99	-1.7660	189.99		309.99	-1.0046
74.95	-1.8161	194.95		314.95	-0.7326
80.01	-1.7819	200.01		320.01	-0.4478
80.08	-1.7668	200.08	-0.8960	320.08	-0.4448
85.13	-1.5950	205.13	-0.9897	325.13	-0.1512
89.99	-1.3336	209.99	-0.9488	329.99	0.1102
94.95	-0.9575	214.95	-0.9453	334.95	0.3652
100.01	-0.9554	220.01	-0.9468	340.01	0.5878
100.08		220.08	-0.9640	340.08	0.5854
105.13		225.13	-0.9473	345.13	0.7665
109.99		229.99	-0.9366	349.99	0.8951
114.95		234.95	-0.9341	354.95	0.9788
120.01		240.01	-0.9269	360.01	1.0116

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	215: 1	0.9985		1.0013	0.9994	0.9975	0.9985		0.9919
9.13	215: 2	0.9346		0.9374	0.9383	0.9383	0.9402		0.9411
13.99	215: 3	0.8207		0.8254	0.8273	0.8273	0.8310		0.8481
18.95	215: 4	0.6641		0.6679	0.6707	0.6725	0.6848		0.7151
24.01	215: 5	0.4474		0.4531	0.4607	0.4626	0.4701		0.5358
64.08	215: 1	-1.4481	-1.5995	-1.5948	-1.5591	-1.5939	-1.5412	-1.5231	
69.13	215: 2	-1.5253	-1.7047	-1.7432	-1.7216	-1.7573	-1.6765	-1.6928	
73.99	215: 3	-1.6147	-1.7867	-1.7669	-1.7867	-1.7735	-1.7435	-1.7250	
78.95	215: 4	-1.6069	-1.6894	-1.7439	-1.7795	-1.7852	-1.6998	-1.7031	
84.01	215: 5	-1.4941	-1.6290	-1.6960	-1.5922	-1.7092	-1.6111	-1.6101	
124.08	215: 1			-0.8763	-0.8595	-0.9053	-0.8922	-0.8734	-0.9215
129.13	215: 2			-0.9072	-0.8913	-0.9408	-0.8857	-0.8993	-0.8823
133.99	215: 3			-0.8722	-0.9115	-0.8928	-0.8956	-0.8866	-0.8564
138.95	215: 4			-0.9230	-0.9202	-0.9305	-0.8857	-0.8682	-0.8729
144.01	215: 5			-0.9578	-0.8949	-0.9550	-0.9015	-0.9014	-0.9222

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 0.435 E+6	K/D = 0.0012	MACH NO. = 0.246
CD = 0.818	CL = -0.058	RUN ID = 226

THETA	CP	THETA	CP	THETA	CP
0.08	0.9737	120.08	-0.9110	240.08	-0.9128
4.94	0.9639	124.94	-0.9459	244.94	-0.9287
9.94		129.94		249.94	
14.90	0.7651	134.90	-0.9793	254.90	-0.9105
19.99	0.5810	139.99	-0.9509	259.99	-0.8732
20.08	0.5784	140.08	-0.9414	260.08	-0.8902
24.94	0.4102	144.94	-0.9467	264.94	-1.0383
29.94		149.94		269.94	
34.90	-0.1152	154.90	-0.9379	274.90	-1.6307
39.99	-0.3958	159.99	-0.9709	279.99	-1.7610
40.08		160.08	-0.8920	280.08	-1.7961
44.94		164.94	-0.9287	284.94	-1.8905
49.94		169.94		289.94	
54.90		174.90	-0.9404	294.90	-1.7510
59.99		179.99	-0.9027	299.99	-1.5536
60.08	-1.5005	180.08		300.08	-1.5541
64.94	-1.6518	184.94		304.94	-1.3638
69.94		189.94		309.94	
74.90	-1.6956	194.90		314.90	-0.8154
79.99	-1.6893	199.99		319.99	-0.4945
80.08	-1.6711	200.08	-0.9542	320.08	-0.4930
84.94	-1.4490	204.94	-0.9799	324.94	-0.1846
89.94		209.94		329.94	
94.90	-0.9592	214.90	-0.9703	334.90	0.3249
99.99	-0.9114	219.99	-0.8929	339.99	0.5612
100.08	-0.9631	220.08	-0.9024	340.08	0.5368
104.94	-0.9151	224.94	-0.9390	344.94	0.7486
109.94		229.94		349.94	
114.90	-0.9592	234.90	-0.9404	354.90	0.9551
119.99	-0.9114	239.99	-0.8830	359.99	0.9954

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	226: 1	0.9529		0.9633	0.9529	0.9425	0.9425		0.9633
8.94	226: 2	0.9126		0.9126	0.9126	0.9126	0.9126		0.9434
13.94	226: 3								
18.90	226: 4	0.6251		0.6251	0.6251	0.6351	0.6251		0.7150
23.99	226: 5	0.4231		0.4133	0.4330	0.4330	0.4330		0.5316
64.08	226: 1	-1.3029	-1.6980	-1.6876	-1.5525	-1.6252	-1.6460	-1.6503	
68.94	226: 2	-1.3748	-1.8569	-1.8056	-1.6620	-1.8159	-1.7646	-1.7775	
73.94	226: 3								
78.90	226: 4	-1.4256	-1.9157	-1.8357	-1.6656	-1.7957	-1.7556	-1.8111	
83.99	226: 5	-1.3537	-1.8077	-1.6202	-1.5116	-1.6103	-1.5807	-1.6128	
124.08	226: 1	-0.8792		-0.8792	-0.8896	-0.8585	-0.8482	-0.8920	-0.7884
128.94	226: 2	-0.9160		-0.8343	-0.8956	-0.8956	-0.8547	-0.9185	-0.8367
133.94	226: 3								
138.90	226: 4	-0.9279		-0.9180	-0.9180	-0.8980	-0.8681	-0.9005	-0.3805
143.99	226: 5	-0.9611		-0.9119	-0.9119	-0.8726	-0.8628	-0.8929	-0.8732

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 0.506 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.910   CL = -0.062   RUN ID = 227

THETA	CP	THETA	CP	THETA	CP
0.07	0.9898	120.07	-1.0485	240.07	-0.9893
4.95	0.9641	124.95	-1.0128	244.95	-0.9963
9.94	0.9129	129.94	-1.0192	249.94	-0.9942
14.89	0.7940	134.89	-1.0240	254.89	-0.9546
20.01		140.01		260.01	
20.07	0.6049	140.07	-1.0279	260.07	-1.0485
24.95	0.3917	144.95	-1.0264	264.95	-1.0727
29.94	0.1533	149.94	-1.0250	269.94	-1.3612
34.89	-0.1180	154.89	-1.0558	274.89	-1.7066
40.01		160.01		280.01	
40.07		160.07	-0.9978	280.07	-1.8450
44.95		164.95	-1.0304	284.95	-1.9370
49.94		169.94	-1.0027	289.94	-1.9168
54.89		174.89	-1.0395	294.89	-1.7919
60.01		180.01		300.01	
60.07	-1.5240	180.07		300.07	-1.6189
64.95	-1.6673	184.95		304.95	-1.3769
69.94	-1.7593	189.94		309.94	-1.1098
74.89	-1.7617	194.89		314.89	-0.8338
80.01		200.01		320.01	
80.07	-1.7594	200.07	-1.1087	320.07	-0.4899
84.95	-1.5434	204.95	-1.0219	324.95	-0.1978
89.94	-1.1816	209.94	-1.0538	329.94	0.0850
94.89	-1.0410	214.89	-1.0225	334.89	0.3421
100.01		220.01		340.01	
100.07	-1.0400	220.07	-1.0405	340.07	0.5621
104.95	-1.0128	224.95	-1.0304	344.95	0.7420
109.94	-1.0021	229.94	-1.0198	349.94	0.8873
114.89	-1.0325	234.89	-1.0055	354.89	0.9727
120.01		240.01		360.01	

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.07	227: 1	0.9727		0.9727	0.9727	0.9727	0.9727		0.9812
8.95	227: 2	0.9129		0.9129	0.9129	0.9129	0.9129		0.9299
13.94	227: 3	0.8020		0.8105	0.8105	0.8105	0.8105		0.8531
18.89	227: 4	0.6493		0.6408	0.6493	0.6493	0.6578		0.7341
24.01	227: 5								
64.07	227: 1	-1.3530	-1.7719	-1.7463	-1.6522	-1.6950	-1.6608	-1.5881	
68.95	227: 2	-1.4708	-1.9066	-1.8724	-1.7272	-1.8041	-1.7784	-1.8087	
73.94	227: 3	-1.4946	-1.9386	-1.9642	-1.7678	-1.8788	-1.9044	-1.8228	
78.89	227: 4	-1.4891	-1.9662	-1.9577	-1.7447	-1.9236	-1.8554	-1.8089	
84.01	227: 5								
124.07	227: 1	-1.0024		-0.9939	-1.0109	-0.9683	-0.9513	-0.9125	-0.9040
128.95	227: 2	-1.0264		-1.0350	-0.9754	-0.9499	-0.9499	-0.9963	-0.9367
133.94	227: 3	-1.0080		-1.0335	-1.0250	-0.9910	-0.9995	-1.0113	-0.9346
138.89	227: 4	-1.0388		-1.0303	-1.0303	-1.0303	-0.9539	-0.9546	-0.8866
144.01	227: 5								

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 0.617 E+6   K/D = 0.0012   MACH NO. = 0.249

CD = 0.944   CL = -0.051   RUN ID = 228

THETA	CP	THETA	CP	THETA	CP
0.08	0.9949	120.08	-1.0403	240.08	-1.0308
5.03	0.9740	125.03	-1.0390	245.03	-1.0529
9.99	0.9132	129.99	-1.0340	249.99	-1.0122
14.94	0.7888	134.94	-1.0574	254.94	-1.0142
20.00	0.6236	140.00	-1.0512	260.00	-1.0293
20.08	0.6145	140.08	-1.0701	260.08	-1.0127
25.03	0.4129	145.03	-1.1033	265.03	-1.1084
29.99	0.1668	149.99	-1.0497	269.99	-1.3425
34.94	-0.1124	154.94	-1.1074	274.94	-1.6359
40.00	-0.3944	160.00	-1.0389	280.00	-1.7539
40.08		160.08	-1.0101	280.08	-1.8434
45.03		165.03	-1.0529	285.03	-1.9066
49.99		169.99	-1.0736	289.99	-1.8772
54.94		174.94	-1.0485	294.94	-1.7668
60.00		180.00	-1.0499	300.00	-1.5542
60.08	-1.5077	180.08		300.08	-1.5431
65.03	-1.7026	185.03		305.03	-1.3535
69.99	-1.7228	189.99		309.99	-1.0724
74.94	-1.7631	194.94		314.94	-0.8002
80.00	-1.6521	200.00		320.00	-0.4769
80.08	-1.7534	200.08	-1.0721	320.08	-0.4712
85.03	-1.4901	205.03	-1.0806	325.03	-0.1759
89.99	-1.1711	209.99	-1.0668	329.99	0.1120
94.94	-1.0712	214.94	-1.0485	334.94	0.3484
100.00	-0.9961	220.00	-1.0293	340.00	0.5960
100.08	-1.0473	220.08	-1.0377	340.08	0.5869
105.03	-1.0459	225.03	-1.0667	345.03	0.7662
109.99	-1.0477	229.99	-1.0327	349.99	0.8857
114.94	-1.0574	234.94	-1.0279	354.94	0.9674
120.00	-0.9961	240.00	-0.9950	360.00	1.0086

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	228: 1	0.9811		0.9811	0.9742	0.9811	0.9742		0.9949
9.03	228: 2	0.9117		0.9186	0.9186	0.9186	0.9117		0.9393
13.99	228: 3	0.8106		0.8243	0.8175	0.8243	0.8175		0.8514
18.94	228: 4	0.6513		0.6444	0.6582	0.6444	0.6513		0.6992
24.00	228: 5	0.4517		0.4517	0.4655	0.4517	0.4517		0.5478
64.08	228: 1	-1.3556	-1.7220	-1.7358	-1.6114	-1.6736	-1.6667	-1.5665	
69.03	228: 2	-1.4876	-1.8482	-1.8898	-1.7511	-1.8343	-1.7996	-1.7330	
73.99	228: 3	-1.5242	-1.9282	-1.8871	-1.7570	-1.8802	-1.8323	-1.7470	
78.94	228: 4	-1.4673	-1.8938	-1.9006	-1.7700	-1.8731	-1.7700	-1.7874	
84.00	228: 5	-1.2809	-1.6521	-1.5971	-1.6109	-1.5903	-1.5834	-1.5197	
124.08	228: 1	-1.0288		-1.0150	-1.0150	-0.9943	-1.0150	-0.9481	-0.9688
129.03	228: 2	-1.0757		-1.0412	-1.0481	-1.0343	-1.0343	-0.9768	-1.0045
133.99	228: 3	-1.0565		-1.0293	-1.0429	-1.0293	-0.9747	-0.9371	-0.9576
138.94	228: 4	-1.0526		-1.0594	-1.0594	-1.0526	-1.0389	-1.0210	-0.9936
144.00	228: 5	-1.0320		-0.9773	-0.9910	-0.9499	-0.9910	-0.9401	-0.9812

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 0.722 E+6	K/D = 0.0012	MACH NO. = 0.251
CD = 0.943	CL = -0.041	RUN ID = 229

THETA	CP	THETA	CP	THETA	CP
0.08	1.0042	120.08	-0.9984	240.08	-1.0142
5.02	0.9864	125.02	-1.0332	245.02	-1.0301
9.99	0.9109	129.99	-1.0341	249.99	-0.9553
14.94	0.7945	134.94	-1.0449	254.94	-1.0126
20.03	0.6154	140.03	-1.0310	260.03	-1.0169
20.08	0.6198	140.08	-1.0333	260.08	-1.0217
25.02	0.4116	145.02	-1.0696	265.02	-1.0978
29.99	0.1704	149.99	-1.0630	269.99	-1.2268
34.94	-0.0911	154.94	-1.0454	274.94	-1.5178
40.03	-0.4006	160.03	-1.0019	280.03	-1.7520
40.08		160.08	-1.0491	280.08	-1.7749
45.02		165.02	-1.0652	285.02	-1.8610
49.99		169.99	-1.0309	289.99	-1.8284
54.94		174.94	-1.0242	294.94	-1.7221
60.03		180.03	-1.0169	300.03	-1.5311
60.08	-1.4563	180.08		300.08	-1.5353
65.02	-1.6587	185.02		305.02	-1.3479
69.99	-1.6894	189.99		309.99	-1.0481
74.94	-1.6767	194.94		314.94	-0.7436
80.03	-1.5799	200.03		320.03	-0.4587
80.08	-1.7223	200.08	-1.0607	320.08	-0.4461
85.02	-1.4970	205.02	-1.0476	325.02	-0.1690
89.99	-1.1859	209.99	-1.0600	329.99	0.1179
94.94	-1.0508	214.94	-1.0649	334.94	0.3691
100.03	-1.0077	220.03	-1.0401	340.03	0.5862
100.08	-1.0509	220.08	-1.0549	340.08	0.6081
105.02	-1.0274	225.02	-1.0359	345.02	0.7635
109.99	-1.0399	229.99	-0.9844	349.99	0.8992
114.94	-1.0274	234.94	-1.0126	354.94	0.9866
120.03	-1.0136	240.03	-0.9995	360.03	1.0158

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	229: 1	1.0042		0.9984	0.9984	1.0042	0.9867		0.9926
9.02	229: 2	0.9278		0.9337	0.9337	0.9337	0.9278		0.9395
13.99	229: 3	0.8177		0.8119	0.8235	0.8235	0.8119		0.8467
18.94	229: 4	0.6548		0.6548	0.6606	0.6606	0.6548		0.7187
24.03	229: 5	0.4413		0.4297	0.4355	0.4413	0.4471		0.5456
64.08	229: 1	-1.2872	-1.6895	-1.6953	-1.5612	-1.6137	-1.6079	-1.5472	
69.02	229: 2	-1.4358	-1.8288	-1.7760	-1.7115	-1.7819	-1.7350	-1.6556	
73.99	229: 3	-1.4679	-1.8877	-1.8644	-1.6836	-1.7886	-1.8061	-1.7057	
78.94	229: 4	-1.4202	-1.8457	-1.8223	-1.6883	-1.7233	-1.8165	-1.7454	
84.03	229: 5	-1.2547	-1.6496	-1.6321	-1.5624	-1.5276	-1.4521	-1.3973	
124.08	229: 1	-0.9985		-1.0391	-0.9810	-0.9694	-0.9869	-0.9444	-0.9037
129.02	229: 2	-1.0579		-1.0170	-1.0287	-1.0404	-1.0054	-0.9424	-1.018.
133.99	229: 3	-1.0282		-1.0398	-1.0049	-0.9527	-0.9875	-0.9495	-0.943.
138.94	229: 4	-1.0454		-1.0338	-1.0396	-1.0164	-1.0396	-0.9719	-0.977.
144.03	229: 5	-0.9961		-0.9904	-1.0077	-0.9904	-0.944.	-0.9011	-0...95

END
9-87
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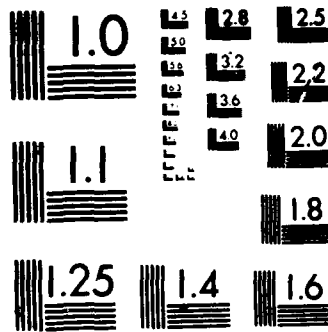
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 0.829 E+6   K/D = 0.0012   MACH NO. = 0.249
CD = 0.963   CL = -0.050   RUN ID = 230

THETA	CP	THETA	CP	THETA	CP
0.08	1.0054	120.08	-1.0278	240.08	-1.0215
4.96	0.9848	124.96	-1.0493	244.96	-0.9844
9.96	0.9182	129.96	-1.0609	249.96	-1.0231
14.92	0.8021	134.92	-1.0724	254.92	-1.0138
20.01	0.6307	140.01	-1.0540	260.01	-1.0122
20.08	0.6167	140.08	-1.0574	260.08	-1.0124
24.96	0.4196	144.96	-1.0840	264.96	-1.0596
29.96	0.1861	149.96	-1.1027	269.96	-1.2506
34.92	-0.0829	154.92	-1.0240	274.92	-1.5104
40.01	-0.3775	160.01	-1.0635	280.01	-1.6830
40.08		160.08	-1.0317	280.08	-1.7140
44.96		164.96	-0.9638	284.96	-1.7856
49.96		169.96	-1.0435	289.96	-1.8043
54.92		174.92	-1.0340	294.92	-1.7039
60.01		180.01	-0.9819	300.01	-1.5105
60.08	-1.4392	180.08		300.08	-1.5262
64.96	-1.6163	184.96		304.96	-1.3020
69.96	-1.6743	189.96		309.96	-1.0427
74.92	-1.6696	194.92		314.92	-0.7491
80.01	-1.6226	200.01		320.01	-0.4433
80.08	-1.6218	200.08	-1.1134	320.08	-0.4368
84.96	-1.3273	204.96	-1.0613	324.96	-0.1457
89.96	-1.1378	209.96	-1.0895	329.96	0.1297
94.92	-1.0419	214.92	-1.0645	334.92	0.3697
100.01	-0.9830	220.01	-1.0678	340.01	0.6052
100.08	-1.0073	220.08	-1.0623	340.08	0.5911
104.96	-1.0132	224.96	-1.0561	344.96	0.7793
109.96	-1.0353	229.96	-1.0384	349.96	0.9028
114.92	-1.0317	234.92	-1.0087	354.92	0.9850
120.01	-1.0033	240.01	-1.0071	360.01	1.0206

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	230: 1	0.9901		0.9901	0.9901	0.9952	0.9798		0.9901
8.96	230: 2	0.9386		0.9437	0.9437	0.9386	0.9334		0.9489
13.96	230: 3	0.8157		0.8209	0.8209	0.8157	0.8260		0.8619
18.92	230: 4	0.6700		0.6700	0.6750	0.6750	0.6700		0.7308
24.01	230: 5	0.4636		0.4636	0.4636	0.4686	0.4788		0.5546
64.08	230: 1	-1.2909	-1.6489	-1.5978	-1.5415	-1.6285	-1.6131	-1.5399	
68.96	230: 2	-1.4158	-1.7448	-1.7808	-1.7191	-1.7089	-1.6420	-1.7393	
73.96	230: 3	-1.4796	-1.8536	-1.8126	-1.7101	-1.7716	-1.7614	-1.7171	
78.92	230: 4	-1.4458	-1.7764	-1.8273	-1.7103	-1.7001	-1.7357	-1.6937	
84.01	230: 5	-1.2631	-1.5923	-1.5771	-1.5366	-1.3948	-1.5062	-1.4243	
124.08	230: 1	-1.0115		-0.9708	-1.0115	-1.0625	-1.0166	-1.0011	-0.9296
128.96	230: 2	-1.0226		-1.0277	-1.0379	-0.9816	-0.9355	-1.0664	-0.9690
133.96	230: 3	-1.0720		-1.0720	-1.0210	-1.0108	-0.9904	-0.9976	-0.9771
138.92	230: 4	-1.0595		-1.0443	-1.0089	-0.9785	-0.9836	-0.9833	-1.0239
144.01	230: 5	-1.0433		-1.0130	-1.0282	-0.9374	-1.0181	-0.9920	-0.9970

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 0.925 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.978   CL = -0.037   RUN ID = 231

THETA	CP	THETA	CP	THETA	CP
0.08	1.0108	120.08	-1.0163	240.08	-1.0328
5.02	0.9969	125.02	-1.0587	245.02	-1.0026
9.97	0.9144	129.97	-1.0534	249.97	-0.9990
14.92	0.7948	134.92	-1.0427	254.92	-1.0256
20.02	0.6292	140.02	-1.0480	260.02	-0.9995
20.08	0.6288	140.08	-1.0331	260.08	-1.0070
25.02	0.4255	145.02	-1.0655	265.02	-1.0356
29.97	0.1753	149.97	-1.0784	269.97	-1.1821
34.92	-0.0831	154.92	-1.0709	274.92	-1.4985
40.02	-0.3828	160.02	-1.0914	280.02	-1.6560
40.08		160.08	-1.0328	280.08	-1.6612
45.02		165.02	-1.0072	285.02	-1.7701
49.97		169.97	-1.0951	289.97	-1.7844
54.92		174.92	-1.1036	294.92	-1.7057
60.02		180.02	-1.0591	300.02	-1.5086
60.08	-1.4329	180.08		300.08	-1.5250
65.02	-1.5753	185.02		305.02	-1.2886
69.97	-1.6703	189.97		309.97	-1.0230
74.92	-1.6908	194.92		314.92	-0.7587
80.02	-1.6108	200.02		320.02	-0.4564
80.08	-1.6336	200.08	-1.0788	320.08	-0.4343
85.02	-1.3728	205.02	-1.0992	325.02	-0.1367
89.97	-1.1913	209.97	-1.0997	329.97	0.1248
94.92	-1.0795	214.92	-1.0760	334.92	0.3811
100.02	-1.0112	220.02	-1.0545	340.02	0.5968
100.08	-1.0439	220.08	-1.0650	340.08	0.5920
105.02	-1.0310	225.02	-1.0302	345.02	0.7757
109.97	-0.9982	229.97	-1.0218	349.97	0.9007
114.92	-1.0243	234.92	-1.0302	354.92	0.9832
120.02	-1.0066	240.02	-1.0270	360.02	1.0108

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	231: 1	1.0016		1.0016	0.9924	1.0016	0.9970		0.9924
9.02	231: 2	0.9416		0.9324	0.9462	0.9462	0.9508		0.9508
13.97	231: 3	0.8134		0.8272	0.8180	0.8226	0.8318		0.8547
18.92	231: 4	0.6662		0.6616	0.6708	0.6662	0.6708		0.7258
24.02	231: 5	0.4544		0.4498	0.4498	0.4590	0.4682		0.5508
64.08	231: 1	-1.3179	-1.6538	-1.6400	-1.5572	-1.5940	-1.5710	-1.5046	
69.02	231: 2	-1.4001	-1.7458	-1.7135	-1.6674	-1.7043	-1.6536	-1.6130	
73.97	231: 3	-1.4453	-1.8631	-1.7300	-1.7529	-1.8034	-1.6978	-1.7430	
78.92	231: 4	-1.4013	-1.7918	-1.7918	-1.6770	-1.7321	-1.7367	-1.6458	
84.02	231: 5	-1.2613	-1.6108	-1.5188	-1.5832	-1.4682	-1.4912	-1.4579	
124.08	231: 1	-1.0102		-1.0377	-0.9965	-1.0056	-0.9965	-0.9502	-0.9180
129.02	231: 2	-1.0242		-1.0150	-1.0058	-1.0334	-0.9783	-0.9291	-0.9383
133.97	231: 3	-1.0556		-1.0236	-1.0601	-1.0464	-1.0099	-1.0218	-1.0035
138.92	231: 4	-1.0435		-1.0938	-1.0618	-1.0160	-1.0664	-0.9935	-0.9522
144.02	231: 5	-1.0731		-0.9998	-1.0273	-0.9952	-0.9907	-0.9811	-0.9903

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 1.027 E+6   K/D = 0.0012   MACH NO. = 0.248
CD = 0.995   CL = -0.034   RUN ID = 232

THETA	CP	THETA	CP	THETA	CP
0.08	1.0072	120.08	-1.0348	240.08	-1.0523
5.04	0.9949	125.04	-1.0440	245.04	-0.9941
9.97	0.9164	129.97	-1.0427	249.97	-1.0148
14.95	0.8001	134.95	-1.0846	254.95	-1.0599
20.05	0.6319	140.05	-1.0921	260.05	-1.0173
20.08	0.6270	140.08	-1.0569	260.08	-1.0099
25.04	0.4181	145.04	-1.0756	265.04	-1.0399
29.97	0.1732	149.97	-1.1091	269.97	-1.2659
34.95	-0.1036	154.95	-1.1223	274.95	-1.4125
40.05	-0.3907	160.05	-1.1329	280.05	-1.6955
40.08		160.08	-1.0523	280.08	-1.7182
45.04		165.04	-1.0517	285.04	-1.7621
49.97		169.97	-1.0519	289.97	-1.7825
54.95		174.95	-1.1550	294.95	-1.7279
60.05		180.05	-1.1202	300.05	-1.5384
60.08	-1.4570	180.08		300.08	-1.5057
65.04	-1.6025	185.04		305.04	-1.2793
69.97	-1.6795	189.97		309.97	-1.0364
74.95	-1.7023	194.95		314.95	-0.7625
80.05	-1.6535	200.05		320.05	-0.4609
80.08	-1.6519	200.08	-1.0853	320.08	-0.4394
85.04	-1.4072	205.04	-1.0599	325.04	-0.1422
89.97	-1.1171	209.97	-1.0807	329.97	0.1154
94.95	-1.1137	214.95	-1.1426	334.95	0.3647
100.05	-1.0384	220.05	-1.0626	340.05	0.5989
100.08	-1.0596	220.08	-1.0894	340.08	0.5980
105.04	-1.0440	225.04	-1.0558	345.04	0.7806
109.97	-1.0303	229.97	-1.0972	349.97	0.8998
114.95	-1.0639	234.95	-1.0558	354.95	0.9780
120.05	-1.0384	240.05	-1.0215	360.05	1.0154

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	232: 1	0.9907		0.9948	0.9948	0.9948	0.9907		0.9907
9.04	232: 2	0.9413		0.9413	0.9454	0.9413	0.9413		0.9413
13.97	232: 3	0.8214		0.8214	0.8214	0.8173	0.8214		0.8503
18.95	232: 4	0.6676		0.6635	0.6676	0.6635	0.6676		0.7087
24.05	232: 5	0.4546		0.4463	0.4546	0.4546	0.4752		0.5536
64.08	232: 1	-1.3164	-1.6472	-1.6637	-1.5521	-1.5686	-1.5934	-1.5194	
69.04	232: 2	-1.4417	-1.7674	-1.7839	-1.7056	-1.7179	-1.7179	-1.6920	
73.97	232: 3	-1.4690	-1.8157	-1.7992	-1.7331	-1.8033	-1.7331	-1.7577	
78.95	232: 4	-1.4413	-1.8390	-1.7520	-1.7479	-1.6650	-1.7272	-1.6532	
84.05	232: 5	-1.2451	-1.6205	-1.5298	-1.6247	-1.4679	-1.4019	-1.4393	
124.08	232: 1	-1.0157		-1.0486	-1.0033	-1.0198	-1.0610	-0.9574	-0.9408
129.04	232: 2	-1.0715		-1.0592	-1.0509	-1.0427	-1.0838	-1.0065	-0.9777
133.97	232: 3	-1.0722		-1.0516	-1.0722	-1.0639	-0.9817	-1.0148	-1.0148
138.95	232: 4	-1.1346		-1.0562	-1.1016	-1.0604	-1.0851	-0.9938	-1.0434
144.05	232: 5	-1.0384		-1.0343	-1.0507	-0.9932	-0.9562	-0.9844	-0.9474

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 1.277 E+6	K/D = 0.0012	MACH NO. = 0.247
CD = 1.020	CL = -0.032	RUN ID = 233

THETA	CP	THETA	CP	THETA	CP
0.08	1.0122	120.08	-1.0953	240.08	-1.0524
5.02	0.9955	125.02	-1.0574	245.02	-1.0616
9.99	0.9220	129.99	-1.1053	249.99	-1.0488
14.94	0.8001	134.94	-1.1114	254.94	-1.0253
20.01	0.6271	140.01	-1.·96	260.01	-1.0580
20.08	0.6119	140.08	-·. ·5	260.08	-1.0555
25.02	0.4076	145.02	-1.· ·7	265.02	-1.0906
29.99	0.1586	149.99	-1.08··	269.99	-1.2288
34.94	-0.0917	154.94	-1.1504	274.94	-1.4669
40.01	-0.4015	160.01	-1.1295	280.01	-1.6948
40.08		160.08	-1.1185	280.08	-1.6785
45.02		165.02	-1.1478	285.02	-1.7960
49.99		169.99	-1.1618	289.99	-1.7965
54.94		174.94	-1.1840	294.94	-1.6896
60.01		180.01	-1.0978	300.01	-1.5385
60.08	-1.4628	180.08		300.08	-1.5148
65.02	-1.6405	185.02		305.02	-1.3127
69.99	-1.6638	189.99		309.99	-1.0648
74.94	-1.7135	194.94		314.94	-0.7612
80.01	-1.6003	200.01		320.01	-0.4778
80.08	-1.6950	200.08	-1.1513	320.08	-0.4531
85.02	-1.4067	205.02	-1.1014	325.02	-0.1603
89.99	-1.1687	209.99	-1.1485	329.99	0.1053
94.94	-1.0881	214.94	-1.1245	334.94	0.3657
100.01	-1.0796	220.01	-1.1110	340.01	0.5906
100.08	-1.0754	220.08	-1.1249	340.08	0.5789
105.02	-1.0807	225.02	-1.1014	345.02	0.7696
109.99	-1.1019	229.99	-1.0887	349.99	0.8919
114.94	-1.0648	234.94	-1.0418	354.94	0.9789
120.01	-1.0397	240.01	-1.0613	360.01	1.0054

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	233: 1	0.9956		0.9956	0.9989	0.9956	0.9956		0.9758
9.02	233: 2	0.9391		0.9424	0.9424	0.9424	0.9457		0.9357
13.99	233: 3	0.8187		0.8287	0.8220	0.8187	0.8287		0.8486
18.94	233: 4	0.6676		0.6709	0.6676	0.6742	0.6775		0.7204
24.01	233: 5	0.4612		0.4479	0.4546	0.4612	0.4745		0.5408
64.08	233: 1	-1.3470	-1.6646	-1.6415	-1.6051	-1.5720	-1.6348	-1.5061	
69.02	233: 2	-1.4546	-1.8098	-1.7832	-1.6903	-1.7202	-1.6870	-1.6396	
73.99	233: 3	-1.4472	-1.8271	-1.8504	-1.8037	-1.8304	-1.7671	-1.6630	
78.94	233: 4	-1.4284	-1.7964	-1.7168	-1.7566	-1.6804	-1.6605	-1.7062	
84.01	233: 5	-1.2451	-1.6500	-1.4675	-1.6401	-1.4575	-1.4509	-1.5352	
124.08	233: 1	-1.0699		-1.0798	-1.0370	-1.0106	-1.0864	-0.9963	-1.0029
129.02	233: 2	-1.0652		-1.1016	-1.0256	-1.0421	-1.0652	-0.9755	-1.0351
133.99	233: 3	-1.0698		-1.0963	-1.0997	-1.1063	-1.0665	-0.9756	-1.0189
138.94	233: 4	-1.0942		-1.0942	-1.0942	-1.0216	-1.0579	-1.0881	-1.0054
144.01	233: 5	-1.0998		-1.0403	-1.0800	-1.0601	-1.0601	-1.0448	-0.9984

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 1.530 E+6	K/D = 0.0012	MACH NO. = 0.247
CD = 1.035	CL = -0.041	RUN ID = 234

THETA	CP	THETA	CP	THETA	CP
0.07	1.0152	120.07	-1.1007	240.07	-1.1192
5.02	0.9933	125.02	-1.0852	245.02	-1.0684
10.02	0.9208	130.02	-1.1000	250.02	-1.0978
14.97	0.7968	134.97	-1.1283	254.97	-1.0747
20.07	0.6243	140.07	-1.1156	260.07	-1.0876
20.07	0.6132	140.07	-1.1653	260.07	-1.1175
25.02	0.4117	145.02	-1.1113	265.02	-1.0935
30.02	0.1571	150.02	-1.1595	270.02	-1.2698
34.97	-0.1049	154.97	-1.1003	274.97	-1.4195
40.07	-0.3929	160.07	-1.1180	280.07	-1.7185
40.07		160.07	-1.1582	280.07	-1.7472
45.02		165.02	-1.1097	285.02	-1.7706
50.02		170.02	-1.1782	290.02	-1.8459
54.97		174.97	-1.1685	294.97	-1.7356
60.07		180.07	-1.1568	300.07	-1.5435
60.07	-1.5028	180.07		300.07	-1.5698
65.02	-1.6220	185.02		305.02	-1.3058
70.02	-1.6896	190.02		310.02	-1.0731
74.97	-1.7212	194.97		314.97	-0.7632
80.07	-1.6403	200.07		320.07	-0.4761
80.07	-1.7304	200.07	-1.2139	320.07	-0.4671
85.02	-1.4417	205.02	-1.1372	325.02	-0.1507
90.02	-1.2002	210.02	-1.0728	330.02	0.1016
94.97	-1.1145	214.97	-1.1354	334.97	0.3598
100.07	-1.0656	220.07	-1.1208	340.07	0.5856
100.07	-1.1035	220.07	-1.1582	340.07	0.5769
105.02	-1.0437	225.02	-1.1097	345.02	0.7700
110.02	-1.0750	230.02	-1.1227	350.02	0.9014
114.97	-1.0867	234.97	-1.0967	354.97	0.9793
120.07	-1.0712	240.07	-1.0848	360.07	1.0042

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.07	234: 1	1.0040		1.0068	1.0040	1.0013	1.0040		0.9845
9.02	234: 2	0.9410		0.9382	0.9410	0.9382	0.9382		0.9382
14.02	234: 3	0.8263		0.8235	0.8319	0.8263	0.8319		0.8486
18.97	234: 4	0.6641		0.6531	0.6586	0.6724	0.6752		0.7138
24.07	234: 5	0.4496		0.4413	0.4468	0.4551	0.4607		0.5385
64.07	234: 1	-1.3716	-1.7010	-1.6954	-1.6368	-1.6926	-1.5949	-1.5625	
69.02	234: 2	-1.4510	-1.7848	-1.7296	-1.7848	-1.7158	-1.7324	-1.6463	
74.02	234: 3	-1.5008	-1.8812	-1.8479	-1.7785	-1.8507	-1.7618	-1.6901	
78.97	234: 4	-1.4279	-1.7987	-1.7766	-1.8319	-1.6576	-1.7323	-1.6081	
84.07	234: 5	-1.3021	-1.5544	-1.5433	-1.6459	-1.5045	-1.5073	-1.3879	
124.07	234: 1	-1.1153		-1.0735	-1.1097	-1.1598	-1.0652	-1.0662	-1.0245
129.02	234: 2	-1.0920		-1.0206	-1.1113	-1.0508	-1.0975	-0.9941	-1.0023
134.02	234: 3	-1.1291		-1.1125	-1.0378	-1.1235	-1.1042	-1.0645	-1.0506
138.97	234: 4	-1.0893		-1.1003	-1.1334	-1.0673	-1.0645	-0.9697	-0.9974
144.07	234: 5	-1.1456		-1.0904	-1.0573	-1.0987	-1.1180	-1.0046	-1.0267

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 1.791 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.997   CL = -0.022   RUN ID = 235

THETA	CP	THETA	CP	THETA	CP
0.08	1.0176	120.08	-0.9866	240.08	-1.0093
5.04	0.9946	125.04	-1.0409	245.04	-1.0045
10.01	0.9216	130.01	-1.0393	250.01	-1.0149
14.98		134.98		254.98	
20.09	0.6335	140.09	-1.0492	260.09	-1.0179
20.08	0.6314	140.08	-1.0635	260.08	-1.0071
25.04	0.4245	145.04	-1.0419	265.04	-1.0478
30.01	0.1905	150.01	-1.0961	270.01	-1.0941
34.98		154.98		274.98	
40.09	-0.3614	160.09	-1.0943	280.09	-1.5779
40.08		160.08	-1.0592	280.08	-1.5554
45.04		165.04	-1.0457	285.04	-1.7210
50.01		170.01	-1.0172	290.01	-1.7294
54.98		174.98		294.98	
60.09		180.09	-1.0982	300.09	-1.4400
60.08	-1.3857	180.08		300.08	-1.4469
65.04	-1.5652	185.04		305.04	-1.2424
70.01	-1.6356	190.01		310.01	-1.0066
74.98		194.98		314.98	
80.09	-1.5832	200.09		320.09	-0.4189
80.08	-1.5918	200.08	-1.0842	320.08	-0.3816
85.04	-1.3501	205.04	-1.1028	325.04	-0.1274
90.01	-1.1284	210.01	-1.0902	330.01	0.1357
94.98		214.98		334.98	
100.09	-1.0124	220.09	-1.0477	340.09	0.6084
100.08	-0.9957	220.08	-1.0728	340.08	0.5974
105.04	-1.0455	225.04	-1.0548	345.04	0.7794
110.01	-1.0324	230.01	-0.9967	350.01	0.9079
114.98		234.98		354.98	
120.09	-1.0170	240.09	-0.9926	360.09	1.0175

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	235: 1	1.0039		1.0039	1.0039	1.0062	1.0039		0.9926
9.04	235: 2	0.9419		0.9442	0.9465	0.9488	0.9442		0.9488
14.01	235: 3	0.8301		0.8301	0.8301	0.8324	0.8301		0.8576
18.98	235: 4								
24.09	235: 5	0.4610		0.4633	0.4679	0.4794	0.4840		0.5533
64.08	235: 1	-1.2903	-1.6012	-1.5899	-1.5264	-1.5354	-1.4719	-1.4439	
69.04	235: 2	-1.4051	-1.7139	-1.6979	-1.6613	-1.6315	-1.6544	-1.5905	
74.01	235: 3	-1.4004	-1.7612	-1.7566	-1.7269	-1.6949	-1.6949	-1.7157	
78.98	235: 4								
84.09	235: 5	-1.2133	-1.4684	-1.3972	-1.5488	-1.3190	-1.3581	-1.3136	
124.08	235: 1	-1.0340		-0.9955	-1.0182	-0.9910	-0.9865	-0.9889	-1.0139
129.04	235: 2	-1.0487		-1.0533	-1.0214	-1.0168	-0.9894	-0.9497	-0.9794
134.01	235: 3	-1.0483		-1.0528	-1.0301	-1.0460	-1.0209	-1.0446	-0.9898
138.98	235: 4								
144.09	235: 5	-1.0279		-1.0256	-1.0118	-0.9546	-1.0004	-0.9651	-0.9192

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 2.056 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.996   CL = -0.028   RUN ID = 236

THETA	CP	THETA	CP	THETA	CP
0.08	1.0193	120.08	-0.9653	240.08	-1.0136
5.15	0.9977	125.15	-1.0269	245.15	-1.0062
10.03	0.9299	130.03	-1.0630	250.03	-1.0010
14.99	0.8108	134.99	-1.0259	254.99	-1.0115
20.05	0.6431	140.05	-1.0499	260.05	-0.9882
20.08	0.6336	140.08	-1.0501	260.08	-1.0068
25.15	0.4219	145.15	-1.0489	265.15	-1.0446
30.03	0.1933	150.03	-1.0963	270.03	-1.1583
34.99	-0.0737	154.99	-1.0796	274.99	-1.3671
40.05	-0.3532	160.05	-1.1029	280.05	-1.6137
40.08		160.08	-1.0591	280.08	-1.6242
45.15		165.15	-1.0495	285.15	-1.7313
50.03		170.03	-1.0803	290.03	-1.7067
54.99		174.99	-1.0452	294.99	-1.6428
60.05		180.05	-1.0771	300.05	-1.4495
60.08	-1.3937	180.08		300.08	-1.4552
65.15	-1.5467	185.15		305.15	-1.2406
70.03	-1.6153	190.03		310.03	-1.0061
74.99	-1.6174	194.99		314.99	-0.7045
80.05	-1.5722	200.05		320.05	-0.4224
80.08	-1.6459	200.08	-1.0551	320.08	-0.4069
85.15	-1.4156	205.15	-1.0888	325.15	-0.1185
90.03	-1.1563	210.03	-1.1121	330.03	0.1476
94.99	-1.0517	214.99	-1.0531	334.99	0.3865
100.05	-1.0005	220.05	-1.0198	340.05	0.6099
100.08	-1.0424	220.08	-1.0314	340.08	0.6000
105.15	-0.9993	225.15	-1.0593	345.15	0.7828
110.03	-1.0192	230.03	-1.0327	350.03	0.9121
114.99	-1.0160	234.99	-1.0115	354.99	0.9895
120.05	-1.0321	240.05	-1.0237	360.05	1.0212

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	236: 1	1.0055		1.0035	1.0055	1.0094	1.0075		0.9956
9.15	236: 2	0.9463		0.9463	0.9523	0.9483	0.9463		0.9425
14.03	236: 3	0.8365		0.8365	0.8365	0.8404	0.8404		0.8565
18.99	236: 4	0.6818		0.6718	0.6838	0.6838	0.6917		0.7277
24.05	236: 5	0.4807		0.4748	0.4827	0.4787	0.4946		0.5664
64.08	236: 1	-1.2909	-1.5913	-1.5874	-1.5044	-1.5419	-1.5063	-1.4916	
69.15	236: 2	-1.3890	-1.7083	-1.7004	-1.6354	-1.6925	-1.6393	-1.6406	
74.03	236: 3	-1.4189	-1.7799	-1.7383	-1.7482	-1.6887	-1.6867	-1.6392	
78.99	236: 4	-1.3180	-1.7185	-1.6828	-1.6451	-1.6412	-1.5183	-1.5218	
84.05	236: 5	-1.1317	-1.4379	-1.4142	-1.5307	-1.4043	-1.3214	-1.3763	
124.08	236: 1	-1.0047		-1.0382	-0.9988	-0.9870	-0.9929	-0.9879	-0.9148
129.15	236: 2	-1.0214		-1.0253	-1.0057	-1.0312	-1.0312	-0.9983	-0.9195
134.03	236: 3	-1.0528		-1.0409	-1.0587	-1.0072	-1.0725	-1.0010	-0.9455
138.99	236: 4	-1.0322		-1.0638	-0.9926	-1.0144	-0.9629	-0.9422	-0.9382
144.05	236: 5	-0.9886		-1.0300	-0.9669	-1.0201	-0.9393	-1.0217	-1.0316

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 2.580 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.995   CL = -0.036   RUN ID = 237

THETA	CP	THETA	CP	THETA	CP
0.08	1.0233	120.08	-1.0112	240.08	-0.9831
5.06	0.9994	125.06	-1.0477	245.06	-1.0108
10.05	0.9265	130.05	-1.0325	250.05	-1.0440
15.01	0.8079	135.01	-1.0458	255.01	-1.0254
20.09	0.6361	140.09	-1.0597	260.09	-1.0382
20.08	0.6385	140.08	-0.9901	260.08	-0.9955
25.06	0.4250	145.06	-1.0498	265.06	-1.0651
30.05	0.1865	150.05	-1.0857	270.05	-1.2161
35.01	-0.0850	155.01	-1.1292	275.01	-1.3448
40.09	-0.3636	160.09	-1.0310	280.09	-1.5718
40.08		160.08	-0.9581	280.08	-1.5303
45.06		165.06	-1.0424	285.06	-1.7412
50.05		170.05	-1.0661	290.05	-1.7621
55.01		175.01	-1.1122	295.01	-1.6658
60.09		180.09	-1.0710	300.09	-1.4731
60.08	-1.3671	180.08		300.08	-1.4404
65.06	-1.5339	185.06		305.06	-1.2775
70.05	-1.6663	190.05		310.05	-1.0076
75.01	-1.6776	195.01		315.01	-0.7300
80.09	-1.5757	200.09		320.09	-0.4309
80.08	-1.5600	200.08	-1.0440	320.08	-0.3923
85.06	-1.3596	205.06	-1.0898	325.06	-0.1335
90.05	-1.1354	210.05	-1.0851	330.05	0.1375
95.01	-1.0853	215.01	-1.0822	335.01	0.3829
100.09	-1.0143	220.09	-1.0491	340.09	0.6052
100.08	-1.0096	220.08	-1.0456	340.08	0.6056
105.06	-1.0351	225.06	-1.0614	345.06	0.7795
110.05	-1.0468	230.05	-1.0709	350.05	0.9140
115.01	-1.0442	235.01	-1.0175	355.01	0.9931
120.09	-1.0456	240.09	-1.0022	360.09	1.0215

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	237: 1	1.0092		1.0092	1.0108	1.0108	1.0108		0.9967
9.06	237: 2	0.9439		0.9455	0.9487	0.9487	0.9487		0.9472
14.05	237: 3	0.8315		0.8300	0.8331	0.8347	0.8379		0.8555
19.01	237: 4	0.6717		0.6686	0.6765	0.6765	0.6844		0.7259
24.09	237: 5	0.4747		0.4621	0.4778	0.4825	0.4841		0.5551
64.08	237: 1	-1.2890	-1.5733	-1.5733	-1.5421	-1.5046	-1.4952	-1.4115	
69.06	237: 2	-1.4153	-1.7252	-1.7442	-1.6889	-1.7395	-1.6572	-1.5987	
74.05	237: 3	-1.4498	-1.7421	-1.7990	-1.7753	-1.7800	-1.6789	-1.6307	
79.01	237: 4	-1.3949	-1.7455	-1.7187	-1.6918	-1.6018	-1.5892	-1.5520	
84.09	237: 5	-1.2206	-1.4990	-1.4756	-1.5867	-1.3676	-1.4130	-1.2742	
124.08	237: 1	-0.9932		-0.9870	-0.9870	-0.9636	-0.9511	-0.9097	-0.9816
129.06	237: 2	-1.0309		-1.0545	-1.0245	-1.0782	-1.0182	-0.9824	-0.9603
134.05	237: 3	-1.0842		-1.0605	-1.0652	-1.0542	-1.0100	-0.9730	-1.0093
139.01	237: 4	-1.0646		-1.0599	-1.0189	-1.0315	-1.0268	-0.9717	-1.0017
144.09	237: 5	-1.0498		-1.0466	-1.0170	-1.0154	-1.0435	-0.8928	-0.9475

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 3.089 E+6   K/D = 0.0012   MACH NO. = 0.248
CD = 0.987   CL = -0.026   RUN ID = 238

THETA	CP	THETA	CP	THETA	CP
0.08	1.0220	120.08	-0.9947	240.08	-1.0028
5.05	0.9985	125.05	-0.9968	245.05	-0.9823
10.04	0.9285	130.04	-1.0454	250.04	-1.0038
15.00	0.8032	135.00	-1.0352	255.00	-1.0238
20.08	0.6348	140.08	-1.0431	260.08	-1.0219
20.08	0.6330	140.08	-1.0283	260.08	-1.0012
25.05	0.4331	145.05	-1.0534	265.05	-1.0385
30.04	0.1823	150.04	-1.0904	270.04	-1.1556
35.00	-0.0671	155.00	-1.0694	275.00	-1.3525
40.08	-0.3630	160.08	-1.0604	280.08	-1.5893
40.08		160.08	-1.0041	280.08	-1.5939
45.05		165.05	-1.0291	285.05	-1.7084
50.04		170.04	-1.0535	290.04	-1.7253
55.00		175.00	-1.0407	295.00	-1.6373
60.08		180.08	-1.0686	300.08	-1.4709
60.08	-1.3861	180.08		300.08	-1.4336
65.05	-1.5933	185.05		305.05	-1.2451
70.04	-1.6736	190.04		310.04	-1.0048
75.00	-1.6471	195.00		315.00	-0.7156
80.08	-1.5942	200.08		320.08	-0.4176
80.08	-1.6470	200.08	-1.0986	320.08	-0.3990
85.05	-1.3787	205.05	-1.0772	325.05	-0.1233
90.04	-1.1570	210.04	-1.0745	330.04	0.1325
95.00	-1.0248	215.00	-1.0420	335.00	0.3839
100.08	-1.0288	220.08	-1.0193	340.08	0.6032
100.08	-0.9765	220.08	-1.0520	340.08	0.6058
105.05	-0.9864	225.05	-1.0330	345.05	0.7796
110.04	-1.0191	230.04	-1.0365	350.04	0.9104
115.00	-1.0170	235.00	-0.9952	355.00	0.9895
120.08	-0.9950	240.08	-1.0037	360.08	1.0180

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.08	238: 1	1.0090		1.0090	1.0090	1.0064	1.0090		0.9974
9.05	238: 2	0.9450		0.9463	0.9476	0.9463	0.9476		0.9490
14.04	238: 3	0.8325		0.8299	0.8339	0.8339	0.8378		0.8579
19.00	238: 4	0.6756		0.6743	0.6795	0.6769	0.6860		0.7217
24.08	238: 5	0.4757		0.4666	0.4810	0.4757	0.4836		0.5511
64.08	238: 1	-1.2825	-1.5714	-1.5752	-1.5170	-1.5416	-1.4872	-1.4603	
69.05	238: 2	-1.3980	-1.7247	-1.7026	-1.6336	-1.6870	-1.6570	-1.5989	
74.04	238: 3	-1.4441	-1.7496	-1.7706	-1.7942	-1.7627	-1.6539	-1.6846	
79.00	238: 4	-1.3887	-1.6757	-1.6562	-1.6835	-1.6419	-1.5575	-1.5879	
84.08	238: 5	-1.2018	-1.5189	-1.4513	-1.5319	-1.4175	-1.3772	-1.3097	
124.08	238: 1	-1.0076		-0.9688	-1.0050	-0.9972	-0.9494	-0.9614	-0.8694
129.05	238: 2	-1.0105		-1.0339	-0.9988	-1.0274	-1.0027	-0.9823	-0.9511
134.04	238: 3	-1.0460		-1.0538	-1.0747	-1.0617	-0.9662	-1.0208	-0.9723
139.00	238: 4	-1.0486		-1.0201	-1.0032	-0.9812	-0.9682	-0.9758	-0.9381
144.08	238: 5	-1.0098		-1.0228	-0.9437	-0.9709	-0.9800	-0.9427	-0.8817

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 3.595 E+6	K/D = 0.0012	MACH NO. = 0.246
CD = 0.987	CL = -0.020	RUN ID = 239

THETA	CP	THETA	CP	THETA	CP
0.05	1.0197	120.05	-1.0348	240.05	-1.0149
5.08	0.9949	125.08	-1.0447	245.08	-1.0315
10.07	0.9252	130.07	-1.0422	250.07	-0.9533
15.01	0.8027	135.01	-1.0425	255.01	-1.0055
20.08	0.6363	140.08	-0.9976	260.08	-0.9685
20.05	0.6287	140.05	-1.0412	260.05	-1.0100
25.08	0.4286	145.08	-1.0481	265.08	-1.0210
30.07	0.1748	150.07	-1.0765	270.07	-1.1411
35.01	-0.0721	155.01	-1.0392	275.01	-1.4053
40.08	-0.3577	160.08	-1.0522	280.08	-1.5743
40.05		160.05	-1.0160	280.05	-1.6388
45.08		165.08	-1.0337	285.08	-1.7896
50.07		170.07	-1.0812	290.07	-1.7134
55.01		175.01	-1.0588	295.01	-1.6345
60.08		180.08	-1.0785	300.08	-1.4474
60.05	-1.4181	180.05		300.05	-1.4788
65.08	-1.5593	185.08		305.08	-1.2624
70.07	-1.6877	190.07		310.07	-1.0073
75.01	-1.6321	195.01		315.01	-0.7182
80.08	-1.5665	200.08		320.08	-0.4178
80.05	-1.6433	200.05	-1.1229	320.05	-0.4217
85.08	-1.4143	205.08	-1.0709	325.08	-0.1388
90.07	-1.2119	210.07	-1.0812	330.07	0.1321
95.01	-1.0458	215.01	-1.0721	335.01	0.3827
100.08	-1.0087	220.08	-1.0163	340.08	0.6003
100.05	-1.0494	220.05	-1.0250	340.05	0.6016
105.08	-1.0210	225.08	-1.0293	345.08	0.7731
110.07	-1.0332	230.07	-1.0038	350.07	0.9074
115.01	-1.0313	235.01	-0.9966	355.01	0.9898
120.08	-0.9786	240.08	-0.9763	360.08	1.0154

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.05	239: 1	1.0050		1.0062	1.0073	1.0062	1.0050		0.9983
9.08	239: 2	0.9429		0.9452	0.9474	0.9474	0.9474		0.9454
14.07	239: 3	0.8294		0.8305	0.8351	0.8339	0.8351		0.8535
19.01	239: 4	0.6735		0.6702	0.6757	0.6746	0.6835		0.7241
24.08	239: 5	0.4724		0.4668	0.4824	0.4824	0.4858		0.5592
64.05	239: 1	-1.3359	-1.6061	-1.6129	-1.5780	-1.5735	-1.5408	-1.5261	
69.08	239: 2	-1.4344	-1.7269	-1.7540	-1.6966	-1.6156	-1.6651	-1.5879	
74.07	239: 3	-1.4564	-1.8023	-1.7809	-1.7383	-1.7327	-1.6978	-1.6740	
79.01	239: 4	-1.3577	-1.7	-1.7077	-1.7344	-1.6466	-1.5177	-1.5210	
84.08	239: 5	-1.1571	-1.5131	-1.4274	-1.5020	-1.3785	-1.3818	-1.3527	
124.05	239: 1	-1.0355		-0.9996	-1.0288	-0.9872	-0.9805	-1.0138	-0.9665
129.08	239: 2	-1.0481		-1.0481	-1.0414	-0.9516	-1.0190	-0.9775	-0.9618
134.07	239: 3	-1.0372		-1.0496	-1.0216	-1.0115	-0.9801	-1.0072	-0.9353
139.01	239: 4	-1.0170		-1.0281	-1.0259	-0.9981	-0.9538	-0.9821	-0.9511
144.08	239: 5	-0.9878		-1.0011	-0.9645	-0.9467	-0.9512	-0.9118	-0.8940

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 4.114 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.964   CL = -0.029   RUN ID = 240

THETA	CP	THETA	CP	THETA	CP
0.05	1.0174	120.05	-1.0125	240.05	-1.0107
5.08	0.9967	125.08	-1.0058	245.08	-0.9762
10.07	0.9246	130.07	-0.9966	250.07	-0.9941
15.03	0.8031	135.03	-1.0408	255.03	-1.0049
20.10	0.6342	140.10	-1.0014	260.10	-0.9911
20.05	0.6337	140.05	-0.9815	260.05	-0.9990
25.08	0.4246	145.08	-1.0412	265.08	-1.0175
30.07	0.1969	150.07	-1.0343	270.07	-1.1777
35.03	-0.0753	155.03	-1.0555	275.03	-1.4205
40.10	-0.3538	160.10	-1.0309	280.10	-1.5751
40.05		160.05	-0.9982	280.05	-1.6410
45.08		165.08	-1.0064	285.08	-1.7321
50.07		170.07	-1.0427	290.07	-1.7383
55.03		175.03	-1.0506	295.03	-1.6382
60.10		180.10	-1.0309	300.10	-1.4730
60.05	-1.4004	180.05		300.05	-1.4637
65.08	-1.5641	185.08		305.08	-1.2518
70.07	-1.6447	190.07		310.07	-0.9990
75.03	-1.6761	195.03		315.03	-0.7210
80.10	-1.5612	200.10		320.10	-0.4228
80.05	-1.6727	200.05	-1.0510	320.05	-0.4068
85.08	-1.3987	205.08	-1.0531	325.08	-0.1309
90.07	-1.1670	210.07	-1.0281	330.07	0.1337
95.03	-1.0544	215.03	-1.0458	335.03	0.3793
100.10	-0.9781	220.10	-1.0367	340.10	0.6011
100.05	-0.9951	220.05	-1.0376	340.05	0.6058
105.08	-1.0331	225.08	-1.0025	345.08	0.7765
110.07	-1.0229	230.07	-1.0009	350.07	0.9063
115.03	-0.9851	235.03	-1.0243	355.03	0.9879
120.10	-0.9946	240.10	-0.9960	360.10	1.0153

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.05	240: 1	1.0049		1.0078	1.0059	1.0049	1.0068		0.9943
9.08	240: 2	0.9420		0.9440	0.9469	0.9440	0.9459		0.9470
14.07	240: 3	0.8310		0.8280	0.8329	0.8319	0.8358		0.8537
19.03	240: 4	0.6731		0.6712	0.6780	0.6741	0.6829		0.7236
24.10	240: 5	0.4724		0.4656	0.4793	0.4812	0.4871		0.5515
64.05	240: 1	-1.3005	-1.6033	-1.6033	-1.5581	-1.5754	-1.4927	-1.4706	
69.08	240: 2	-1.4161	-1.7015	-1.7444	-1.6547	-1.6849	-1.6333	-1.6434	
74.07	240: 3	-1.4211	-1.7604	-1.7964	-1.7400	-1.7351	-1.6467	-1.6809	
79.03	240: 4	-1.3826	-1.7298	-1.6869	-1.6966	-1.6556	-1.6400	-1.6324	
84.10	240: 5	-1.2008	-1.4776	-1.4456	-1.5175	-1.3610	-1.3436	-1.3359	
124.05	240: 1	-1.0295		-0.9987	-0.9901	-1.0189	-0.9748	-0.8916	-0.9348
129.08	240: 2	-1.0091		-0.9897	-1.0072	-0.9829	-0.9479	-0.9996	-0.9333
134.07	240: 3	-0.9848		-1.0062	-1.0140	-0.9839	-0.9625	-0.9941	-0.3814
139.03	240: 4	-1.0331		-1.0166	-1.0068	-0.9825	-1.0282	-0.9971	-0.9094
144.10	240: 5	-1.0280		-0.9950	-0.9688	-1.0028	-0.9155	-0.9329	-0.9047

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 5.097 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.965   CL = -0.023   RUN ID = 241

THETA	CP	THETA	CP	THETA	CP
0.05	1.0169	120.05	-1.0038	240.05	-0.9921
5.08	0.9952	125.08	-1.0372	245.08	-0.9957
10.07	0.9236	130.07	-1.0436	250.07	-1.0364
15.03	0.8029	135.03	-1.0363	255.03	-0.9895
20.06	0.6336	140.06	-1.0137	260.06	-1.0217
20.05	0.6294	140.05	-1.0200	260.05	-0.9953
25.08	0.4238	145.08	-1.0669	265.08	-1.0303
30.07	0.1756	150.07	-1.0901	270.07	-1.2035
35.03	-0.0785	155.03	-1.0418	275.03	-1.4157
40.06	-0.3765	160.06	-1.0249	280.06	-1.6385
40.05		160.05	-1.0383	280.05	-1.6199
45.08		165.08	-1.0413	285.08	-1.7414
50.07		170.07	-1.0678	290.07	-1.7951
55.03		175.03	-1.0471	295.03	-1.6548
60.06		180.06	-1.0460	300.06	-1.4970
60.05	-1.4187	180.05		300.05	-1.4795
65.08	-1.6184	185.08		305.08	-1.2704
70.07	-1.6824	190.07		310.07	-1.0365
75.03	-1.6518	195.03		315.03	-0.7324
80.06	-1.6080	200.06		320.06	-0.4432
80.05	-1.7110	200.05	-1.0360	320.05	-0.4158
85.08	-1.4829	205.08	-1.0815	325.08	-0.1352
90.07	-1.2122	210.07	-1.0781	330.07	0.1260
95.03	-1.0550	215.03	-1.0416	335.03	0.3793
100.06	-1.0177	220.06	-1.0170	340.06	0.5979
100.05	-0.9412	220.05	-1.0006	340.05	0.6016
105.08	-1.0132	225.08	-1.0212	345.08	0.7772
110.07	-1.0294	230.07	-1.0403	350.07	0.9050
115.03	-1.0145	235.03	-0.9942	355.03	0.9865
120.06	-0.9784	240.06	-1.0092	360.06	1.0176

CP VS. X/D

THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.05	241: 1	1.0045		1.0053	1.0068	1.0053	1.0061		0.9937
9.08	241: 2	0.9417		0.9425	0.9448	0.9440	0.9440		0.9435
14.07	241: 3	0.8296		0.8256	0.8319	0.8272	0.8335		0.8514
19.03	241: 4	0.6725		0.6678	0.6779	0.6787	0.6803		0.7195
24.06	241: 5	0.4641		0.4649	0.4727	0.4680	0.4830		0.5484
64.05	241: 1	-1.3131	-1.6069	-1.5576	-1.5483	-1.5953	-1.5722	-1.5234	
69.08	241: 2	-1.4259	-1.7359	-1.7390	-1.7018	-1.6740	-1.6601	-1.6252	
74.07	241: 3	-1.5100	-1.8163	-1.8494	-1.6942	-1.8408	-1.7438	-1.7619	
79.03	241: 4	-1.3616	-1.7576	-1.7763	-1.7055	-1.6417	-1.6051	-1.6003	
84.06	241: 5	-1.2124	-1.5562	-1.5075	-1.5264	-1.4377	-1.4644	-1.3446	
124.05	241: 1	-1.0139		-0.9385	-0.9923	-0.9946	-0.9869	-0.9728	-0.9281
129.08	241: 2	-0.9936		-1.0222	-1.0276	-0.9967	-0.9844	-0.9671	-0.9748
134.07	241: 3	-1.0846		-1.0602	-0.9989	-1.0594	-1.0154	-1.0324	-0.9970
139.03	241: 4	-1.0403		-1.0481	-0.9991	-0.9479	-0.9425	-0.9343	-0.9382
144.06	241: 5	-1.0226		-1.0233	-0.9889	-0.9803	-1.0179	-0.9786	-0.8798

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 6.121 E+6   K/D = 0.0012   MACH NO. = 0.247
CD = 0.963   CL = -0.026   RUN ID = 242

THETA	CP	THETA	CP	THETA	CP
0.05	1.0154	120.05	-0.9858	240.05	-1.0014
5.08	0.9954	125.08	-0.9973	245.08	-0.9679
10.07	0.9244	130.07	-1.0368	250.07	-1.0141
15.03	0.8026	135.03	-1.0264	255.03	-1.0091
20.09	0.6327	140.09	-0.9980	260.09	-0.9949
20.05	0.6291	140.05	-1.0031	260.05	-0.9972
25.08	0.4258	145.08	-1.0531	265.08	-1.0402
30.07	0.1855	150.07	-1.0329	270.07	-1.1903
35.03	-0.0803	155.03	-1.0693	275.03	-1.4389
40.09	-0.3594	160.09	-1.0093	280.09	-1.5743
40.05		160.05	-1.0224	280.05	-1.6667
45.08		165.08	-1.0242	285.08	-1.7354
50.07		170.07	-1.0609	290.07	-1.7744
55.03		175.03	-1.0530	295.03	-1.6776
60.09		180.09	-1.0626	300.09	-1.4770
60.05	-1.4008	180.05		300.05	-1.4895
65.08	-1.6101	185.08		305.08	-1.2721
70.07	-1.6620	190.07		310.07	-1.0239
75.03	-1.6864	195.03		315.03	-0.7450
80.09	-1.5733	200.09		320.09	-0.4356
80.05	-1.7211	200.05	-1.0535	320.05	-0.4089
85.08	-1.5033	205.08	-1.0427	325.08	-0.1361
90.07	-1.2134	210.07	-1.0673	330.07	0.1264
95.03	-1.0736	215.03	-1.0394	335.03	0.3724
100.09	-0.9967	220.09	-1.0090	340.09	0.5955
100.05	-1.0303	220.05	-0.9900	340.05	0.6025
105.08	-1.0139	225.08	-1.0178	345.08	0.7789
110.07	-0.9995	230.07	-1.0186	350.07	0.9055
115.03	-1.0000	235.03	-1.0053	355.03	0.9848
120.09	-0.9672	240.09	-0.9898	360.09	1.0167

THETA	RUN:SEQ	CP VS. X/D X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.05	242: 1	1.0027		1.0033	1.0065	1.0027	1.0027		0.9932
9.08	242: 2	0.9414		0.9440	0.9459	0.9459	0.9465		0.9455
14.07	242: 3	0.8335		0.8290	0.8322	0.8316	0.8380		0.8534
19.03	242: 4	0.6697		0.6697	0.6788	0.6743	0.6781		0.7200
24.09	242: 5	0.4665		0.4716	0.4832	0.4806	0.4851		0.5533
64.05	242: 1	-1.3270	-1.6209	-1.6305	-1.5573	-1.5630	-1.5287	-1.5075	
69.08	242: 2	-1.4279	-1.7448	-1.7300	-1.6646	-1.6614	-1.6229	-1.6677	
74.07	242: 3	-1.4531	-1.8015	-1.8060	-1.7410	-1.7982	-1.7070	-1.6445	
79.03	242: 4	-1.3877	-1.7898	-1.7278	-1.7122	-1.6877	-1.6773	-1.6385	
84.09	242: 5	-1.2409	-1.6284	-1.5066	-1.5195	-1.3721	-1.3650	-1.3094	
124.05	242: 1	-1.0126		-1.0291	-0.9993	-0.9454	-0.9587	-0.8942	-0.9437
129.08	242: 2	-1.0065		-1.0059	-0.9886	-0.9599	-0.9925	-0.9890	-0.9852
134.07	242: 3	-1.0240		-1.0259	-1.0509	-1.0259	-1.0144	-0.9564	-0.9539
139.03	242: 4	-0.9997		-1.0126	-1.0145	-1.0055	-1.0133	-1.0175	-0.9511
144.09	242: 5	-0.9876		-0.9722	-0.9920	-0.9391	-0.9601	-0.8914	-0.9086

ROUGH CYLINDER (NO. 60 MESH SCREEN)

REY NO. = 7.297 E+6	K/D = 0.0012	MACH NO. = 0.247
CD = 0.952	CL = -0.028	RUN ID = 243

THETA	CP	THETA	CP	THETA	CP
0.05	1.0159	120.05	-0.9845	240.05	-1.0019
5.08	0.9968	125.08	-1.0117	245.08	-0.9780
10.07	0.9256	130.07	-1.0098	250.07	-1.0025
15.03	0.8068	135.03	-1.0099	255.03	-0.9936
20.06	0.6360	140.06	-1.0247	260.06	-0.9887
20.05	0.6345	140.05	-1.0261	260.05	-1.0035
25.08	0.4284	145.08	-1.0546	265.08	-1.0441
30.07	0.1807	150.07	-1.0390	270.07	-1.2222
35.03	-0.0637	155.03	-1.0471	275.03	-1.4249
40.06	-0.3647	160.06	-1.0167	280.06	-1.6202
40.05		160.05	-1.0061	280.05	-1.6808
45.08		165.08	-1.0576	285.08	-1.7602
50.07		170.07	-1.0358	290.07	-1.7833
55.03		175.03	-0.9905	295.03	-1.6721
60.06		180.06	-1.0156	300.06	-1.4732
60.05	-.4287	180.05		300.05	-1.4808
65.08	-1.6205	185.08		305.08	-1.2604
70.07	-1.6666	190.07		310.07	-1.0282
75.03	-1.6851	195.03		315.03	-0.7376
80.06	-1.5862	200.06		320.06	-0.4409
80.05	-1.7014	200.05	-1.0543	320.05	-0.4065
85.08	-1.4763	205.08	-1.0872	325.08	-0.1507
90.07	-1.2100	210.07	-1.0326	330.07	0.1288
95.03	-1.0268	215.03	-1.0261	335.03	0.3756
100.06	-1.0167	220.06	-1.0220	340.06	0.5982
100.05	-1.0125	220.05	-1.0118	340.05	0.6088
105.08	-1.0287	225.08	-1.0170	345.08	0.7728
110.07	-1.0061	230.07	-1.0094	350.07	0.9090
115.03	-0.9825	235.03	-0.9941	355.03	0.9860
120.06	-0.9911	240.06	-0.9861	360.06	1.0174

					CP	VS.	X/D			
THETA	RUN:SEQ	X/D= 0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
4.05	243: 1	1.0054		1.0043	1.0054	1.0043	1.0054		0.9976
9.08	243: 2	0.9437		0.9448	0.9480	0.9437	0.9480		0.9456
14.07	243: 3	0.8326		0.8289	0.8326	0.8316	0.8385		0.8567
19.03	243: 4	0.6804		0.6746	0.6809	0.6809	0.6856		0.7278
24.06	243: 5	0.4719		0.4682	0.4793	0.4815	0.4910		0.5516
64.05	243: 1	-1.3431	-1.6074	-1.6210	-1.4991	-1.6200	-1.5144	-1.4721	
69.08	243: 2	-1.4607	-1.7607	-1.7518	-1.6570	-1.7322	-1.6332	-1.5875	
74.07	243: 3	-1.4626	-1.8224	-1.8372	-1.7302	-1.8086	-1.7339	-1.6970	
79.03	243: 4	-1.3657	-1.7103	-1.7418	-1.6520	-1.6299	-1.6882	-1.6134	
84.06	243: 5	-1.2772	-1.6371	-1.4951	-1.5778	-1.4415	-1.4060	-1.4402	
124.05	243: 1	-1.0061		-0.9988	-0.9726	-1.0161	-0.9349	-0.9757	-0.9469
129.08	243: 2	-1.0097		-1.0129	-1.0118	-1.0086	-0.9696	-0.9411	-0.9115
134.07	243: 3	-1.0031		-1.0459	-1.0253	-1.0623	-1.0337	-1.0284	-0.9582
139.03	243: 4	-0.9874		-1.0047	-0.9858	-0.9496	-0.9916	-0.9831	-0.9606
144.06	243: 5	-1.0336		-0.9977	-0.9792	-0.9871	-0.9665	-0.9296	-0.9370

APPENDIX VI

CYLINDER FLOW RUN LOG

Notation:

G	-	Good Pressure Distribution
R	-	Ragged Pressure Distribution
T	-	Bimodal Flow
O	-	Non-standard Sequence Order
CONF1	-	$k/D = 0.0$
CONF2	-	$k/D = 0.0003$
CONF3	-	$k/D = 0.0012$
CONF4	-	$k/D = 0.0101$

```
RUN #     5  CONF1  BAD SEQS:       5   BAD PORTS: 310                       COMMENT:        DIGITIZE: Y
RUN #     6  CONF1  BAD SEQS:           BAD PORTS: 310                       COMMENT:        DIGITIZE: Y
RUN #     7  CONF1  BAD SEQS:           BAD PORTS: 305 307 310               COMMENT: R      DIGITIZE: Y
RUN #     8  CONF1  BAD SEQS:           BAD PORTS: 307 310                   COMMENT: R      DIGITIZE: Y
RUN #     9  CONF1  BAD SEQS:           BAD PORTS: 307 310                   COMMENT: R      DIGITIZE: Y
RUN #    12  CONF1  BAD SEQS: 1         BAD PORTS: 104 310                   COMMENT:        DIGITIZE: Y
RUN #    14  CONF1  BAD SEQS: 2         BAD PORTS: 104 310                   COMMENT:        DIGITIZE: Y
RUN #    15  CONF1  BAD SEQS: 1         BAD PORTS: 104 310                   COMMENT:        DIGITIZE: Y
RUN #    16  CONF1  BAD SEQS:           BAD PORTS: 104 310                   COMMENT:        DIGITIZE: Y
RUN #    18  CONF1  BAD SEQS:       5   BAD PORTS: 104 310                   COMMENT: R      DIGITIZE: Y
RUN #    20  CONF1  BAD SEQS:           BAD PORTS: 104 310                   COMMENT:        DIGITIZE: Y
RUN #    22  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE: Y
RUN #    23  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE: Y
RUN #    34  CONF1  BAD SEQS:           BAD PORTS: 104 110 202 310           COMMENT: O,R    DIGITIZE:
RUN #    35  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE:
RUN #    36  CONF1  BAD SEQS: 1         BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE:
RUN #    37  CONF1  BAD SEQS: 1         BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE:
RUN #    39  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE:
RUN #    40  CONF1  BAD SEQS: 1         BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE:
RUN #    44  CONF1  BAD SEQS: 1         BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    52  CONF1  BAD SEQS:  2        BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    53  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    54  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    55  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    56  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    57  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    58  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    59  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    60  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    61  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: T,R    DIGITIZE:
RUN #    63  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: T      DIGITIZE:
RUN #    64  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    65  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    66  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    67  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    68  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    69  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    70  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    71  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    72  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE:
RUN #    73  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE:
RUN #    74  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE:
RUN #    75  CONF1  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: T      DIGITIZE:
RUN #    76  CONF1  BAD SEQS:           BAD PORTS: 104 110 202 310           COMMENT: T,O,R  DIGITIZE:
RUN #    78  CONF1  BAD SEQS:       5   BAD PORTS: 104 202 310               COMMENT: T,O,R  DIGITIZE:
RUN #    82  CONF1  BAD SEQS:       5   BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE:
RUN #    91  CONF1  BAD SEQS: 1         BAD PORTS: 104 202 310 602           COMMENT: R      DIGITIZE: Y
RUN #    92  CONF1  BAD SEQS:           BAD PORTS: 104 202 309 310           COMMENT: R      DIGITIZE: Y
RUN #    93  CONF1  BAD SEQS:           BAD PORTS: 104 202 309 310           COMMENT: R      DIGITIZE: Y
RUN #    94  CONF1  BAD SEQS:           BAD PORTS: 104 202 309 310           COMMENT:        DIGITIZE: Y
RUN #    95  CONF1  BAD SEQS:           BAD PORTS: 104 202 309 310           COMMENT: R      DIGITIZE:
RUN #    96  CONF1  BAD SEQS: 1         BAD PORTS: 104 202 309 310           COMMENT: T,R    DIGITIZE:
RUN #    98  CONF1  BAD SEQS:  2        BAD PORTS: 104 202 309 310           COMMENT:        DIGITIZE:
RUN #   103  CONF1  BAD SEQS: 1         BAD PORTS: 104 202 309 310           COMMENT:        DIGITIZE:
RUN #   132  CONF4  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE: Y
RUN #   133  CONF4  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE: Y
RUN #   134  CONF4  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT:        DIGITIZE: Y
RUN #   135  CONF4  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE: Y
RUN #   136  CONF4  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: G      DIGITIZE: Y
RUN #   137  CONF4  BAD SEQS:           BAD PORTS: 104 202 310               COMMENT: R      DIGITIZE: Y
```

```
RUN #  139  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  140  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  142  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT: R    DIGITIZE: Y
RUN #  143  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT: R    DIGITIZE: Y
RUN #  144  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  145  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  146  CONF4  BAD SEQS:    4   BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  147  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  148  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  152  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT: R    DIGITIZE: Y
RUN #  153  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  154  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  155  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  156  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  157  CONF4  BAD SEQS:        BAD PORTS: 104 202 310          COMMENT:      DIGITIZE: Y
RUN #  188  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 507 603  COMMENT:      DIGITIZE: Y
RUN #  189  CONF2  BAD SEQS:    3   BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  192  CONF2  BAD SEQS: 1      BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  193  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  194  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  195  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  196  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  198  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  199  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  200  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  201  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  202  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  203  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  204  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  205  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  206  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  208  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  210  CONF2  BAD SEQS:    2   BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  211  CONF2  BAD SEQS:     5  BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  212  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  213  CONF2  BAD SEQS:    3   BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  214  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  215  CONF2  BAD SEQS:        BAD PORTS: 104 202 310 603      COMMENT:      DIGITIZE: Y
RUN #  226  CONF3  BAD SEQS:    3   BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  227  CONF3  BAD SEQS:     5  BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  228  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  229  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  230  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  231  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  232  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  233  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  234  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  235  CONF3  BAD SEQS:    4   BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  236  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  237  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  238  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  239  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  240  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  241  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  242  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
RUN #  243  CONF3  BAD SEQS:        BAD PORTS: 104 202 310 504 603  COMMENT:      DIGITIZE: Y
```

END

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DTIC